COMPUTERWORLD

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NEWSPAPER

Looks at NCC

NCC Predicting 35,000 for Show

CHICAGO – With preregistrations running at more than double the rate set last year, organizers of this year's National Computer Conference are predicting total registration of over 35,000 for the May 6-10 show here.

The American Federation of Information Processing Societies (Afips), which sponsors the shows, said last week this year's version would probably be the largest computer conference ever in terms of attendees, eclipsing even the large Joint Computer Conferences in the late 1960s.

Not only are preregistration figures up, but registration at Chicago area hotels is also double last year's figures, Afips said.

In addition, the number of booths for the show is close to a sellout, spokesmen said, with 250 companies now planning to occupy 810 booths in the cavernous McCormick Place here.

At the same time, Afips revealed that the annual Harry Goode Memorial Award will go to Dr. Edsger W. Dijkstra, a research fellow of the Burroughs Corp. in The Netherlands – the first time the award has gone outside the U.S.

The award will be for Dijkstra's contributions to the theory and practice of programming and to its development as a science, according to Afips.

Besides the huge exhibits and number of attendees expected for the upcoming show, there will also be a record number of technical sessions – 119 – presented during the five-day event.

There are also four major addresses scheduled this year, including an address by Vice-President Gerald M. Ford on privacy and data banks.

The keynote address for the conference will be given by George Glaser, Afips president, on the state of the computer industry and on computer applications worldwide.

The conference luncheon will be addressed by C.W. Spangle, executive vice-president of Honeywell, Inc., and the industry luncheon will feature a speech by John D. deButts, chairman and chief executive officer of AT&T.

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Home Terminals: They're Coming ... Slowly

By Richard Kuehn
Special to Computerworld

For the past 10 years people have taked about the "checkless society" and other no-paper transactions as "right around the corner." In the real world it seems to be a long block with construction on the far end. In other words, it seems like it will never happen.

There seems no question this will occur, but when?

If any time frame is to be established, it would be best to see just what is planned as home terminals and how they can benefit society.

There are essentially three applications for home terminals:

- To pay bills without the use of checks.
- As a computation device.
- To order merchandise for purchase.

If these are viewed in inverse order, the lack of growth can be easily understood.

To purchase merchandise requires the dual usage of both pictoral and responsive media. This means that both the merchandise to be purchased must be viewed and some method of immediate ordering must be available to the potential buyer. Because of the division of visual and

(Continued on Page 5)

CW Special Report on Autotransaction

Follows Page 20

Disgruntled DPer Aims To Show System Insecure

To Prove a Point He Commandeers 370

By Robert Glass
Special to Computerworld

CORVALLIS, Ore. – In an effort to discredit the state's use of a 370/158 for educational time-sharing and demonstrate the fallibility of IBM's OS/MVT operating system, a state employee took over, via a remote terminal here, control of the 158 located in the state Department of Motor Vehicles (DMV) in Salem. And after accessing the DMV files, he deliberately put the system into an unrecoverable crash.

The takeover, carried out by Bill Fellinger, a member of the Oregon Department of Higher Education (ODHE) network planning team, was a culmination of a series of disputes between ODHE and higher administrative officers, including the Legislative Fiscal Office, regarding the role of IBM in the state's DP future.

Fellinger feels Oregon's "bureaucrats" rely on the advice of IBM representatives to the exclusion of their own technical specialists.

Roots of Conflict

The conflict began last fall when ODHE issued a request for information (RFI) to approximately 80 manufacturers of computing equipment, to allow ODHE to generate a long-term plan for higher education's computing network requirements. The RFI was accompanied, according to Fellinger, by assurances that any resulting competition would be fair and open, since many companies had expressed concern that Oregon was "sewed up" by IBM.

An acquisition plan was drawn up and modified several times, Fellinger said, with inputs from IBM figuring in the modifications. It was in the middle of these iterations that the head of the executive department's Data Systems Division suggested that, while waiting for plan approval and enactment, DMV's 370/158 be used to supply interim time-sharing service to Oregon's higher education students.

Fellinger said his warning that OS/MVT was not secure from the tamperings of inquisitive students fell on deaf ears. It was then that he decided to hijack the system in order to show it was not secure from unauthorized access.

Taking over the computer was extremely easy, he said. With one key piece of information – the name of the root of the file directory tree – he was able to access and manipulate all of DMV's files at will.

While he was in control of the computer, Fellinger:

- Obtained a listing of all the files on the system, with passwords.
- Browsed through various DMV files.
- Told OS/MVT that his remote terminal was the operator's console.

(Continued on Page 2)

State Will Now Beef Up Security

Special to Computerworld

SALEM, Ore. – New security measures are being instituted to prevent recurrence of the recent incident in which a remote terminal user gained control of the State Department of Motor Vehicle's (DMV) IBM 370/158, according to Jerry Schmitz, director of the state's Data Systems Division.

Procedural changes have been implemented within DMV relating to password definition and access, and the plan to use the OS-based time-sharing capability of the 370/158 to support higher education time-sharing student users has been shelved.

Schmitz said a three-pronged effort under way underscores the state's concern in the general areas of privacy and security.

First, an executive order dealing with state policy on criminal history data files has been issued by the governor's office, essentially giving each person in the state access to any record in his file and authorizing the state police to issue rules and regulations governing future access to

(Continued on Page 2)

Onus of Security Put on Top Executives

By E. Drake Lundell Jr.
Of the CW Staff

SPRINGFIELD, Ill. – "Attaining and maintaining a justifiable balance between the right to privacy and the need for information is a . . . great challenge confronting all executives in our society of organizations."

This is the first of a two-part report on the Project Safe study, which is the first published finding from the IBM security project established two years ago. Full reports on the Safe project, as well as on an MIT program, a project at TRW Systems and an internal IBM study, will be presented at the National Computer Conference, May 6-10 in Chicago.

That is one of the conclusions of the first available report from one of the four IBM security sites established two years ago to fully explore the issue of data security.

The report, from the Illinois Secure Automated Facility Environment (Safe) project, emphasizes that the top executives in an organization must take the responsibility for leading the fight for privacy of computer-based records on individuals.

In addition, the study emphasized there is much more to the issue of privacy than just data security – a conclusion that may not have been foreseen when IBM set up the project in a keynote speech by then IBM Chairman T. Vincent Learson at the 1972 Spring Joint Computer Conference.

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Charlotte Caravan

Due to a printing mixup the address for this week's Computer Caravan/74 program in Charlotte, N.C., was given incorrectly in much of the literature and brochures sent to attendees. The correct address is the Charlotte Civic Center, 101 South College St.

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To Prove a Point He Commandeers 370

(Continued from Page 1)

● Deliberately put the system into an unrecoverable crash.

Fellinger, who has been asked to resign, did not try to disguise his actions. In fact, while he was in control, he sent an operator's message worded, "This crash is brought to you by ODHE – tell Duane Wolf, Legislative Fiscal Office. Thank You."

The incident might have remained an internal political squabble if the Portland State University student newspaper had not printed its own version of the story. According to Fellinger, the Portland State story was largely fiction, designed to "smoke out" the true story. It claimed that Fellinger, while in control of the system, had written fraudulent checks and performed other illegal maneuvers.

Freeman Holmer, vice-chancellor for administration at ODHE and Fellinger's superior, is convinced Fellinger's action was "in what he conceived to be the public interest." He specifically branded the college newspaper story "absolutely false."

However, he said, "I regret Fellinger chose the method he did. Fellinger was asked to resign because his action was without authorization, was a gross error in judgment, improperly implied that ODHE supported him and caused substantial costs to put the DMV computer system back up."

Regarding Fellinger's charges that Oregon favors IBM in computer selections, Holmer pointed to a Digital Equipment Corp. PDP-10 at the University of Oregon and a Control Data 3300 at Oregon State University.

But he admitted the majority of executive department computers are IBM and that centers tend to stay with IBM because of software conversion costs. He also noted that the state staff in Salem, the state capital, is subject to lobbying from the IBM office there. However, on balance, Holmer feels "the State of Oregon is a competitive state."

Fellinger does not concur with this assessment of the computer acquisition practices in the state and feels one way to avoid these kinds of problems would be by a gubernatorial appointment of one or more independent computer science professionals to provide review of existing and proposed state data processing systems.

As for the security issue, Fellinger believes secure computers and file systems are within the state of the art. He pointed to Oregon State University's in-house OS-3 system, implemented since the 1960s on a CDC 3300, as an example. He also quoted from the computing literature that "most computer systems available today are invitations to disaster" and that the right of privacy is threatened by utilizing those systems for sensitive data.

State Now Beefs Up Security

(Continued from Page 1)

such data.

Second, elaborate installation security guidelines have been issued to all state computing installations. Conformance to the guidelines will be reviewed in four to six months by state officials.

Third, several bills will be put into the legislative hopper:

● A bill to make tampering with a state computing installation a criminal offense.

● A bill to define more specific criminal fines in the privacy area.

● A bill providing for security and privacy for personal data.

The bills are similar to those being prepared in other states, according to Schmitz.

State Sets Example

In spite of the takeover incident and related charges of IBM favoritism in high-level state circles, Schmitz feels Oregon is a good example of a state which is making consolidation of computing facilities work.

There are three program areas in the state, each of which operates from its own centralized data processing facility: criminal justice, human resources and transportation. And a fourth program area, higher education, operates from only two or three major installations.

This is a reduction from 12 state computer facilities a few years ago, according to Schmitz.

Part of the five-year consolidation plan involves an educational program for upper-middle state officials on the subject of data processing.

Six hundred to 700 managers have already been trained, according to Schmitz.

Regarding the charge that IBM has the State of Oregon locked up, Schmitz stated that the IBM concentration of equipment in Oregon, about 65%, is not greater than in many other states.

He did, however, discuss the problem of finding vendor maintenance support in the somewhat remote Salem area, and noted the financial problems of several non-IBM vendors with whom Oregon is doing business.

...With a Little Friendly Help

Special to Computerworld

SALEM, Ore. – There was an unidentified friend who helped Bill Fellinger hijack the State of Oregon's Department of Motor Vehicles (DMV) computer, according to Don Stur, deputy director of DMV.

The friend, presumably a DMV timesharing user who fed Fellinger necessary information, "will be fired" if a solid case can be made against him, according to Stur.

There is a suspect in the case, but there has been no confession, he said.

Stur characterized Fellinger as "some kind of fanatic," and said DMV was "quite riled" at the incident and "strongly influenced the state's decision to fire him."

Downplaying the impact of the incident, Stur said Fellinger's action was "like pulling a light switch" and "could be happened inadvertently."

The files through which Fellinger browsed, and in fact all of the DMV's computerized files, are public information, according to Stur, and there was therefore no threat to privacy in Fellinger's action.

DMV's only nonpublic files – accident reports and medical information – are not computerized because they do not lend themselves to automation, according to Stur.

Therefore, he said, DMV data processing is "not a secure environment and not concerned with being one."

Correction

Re announcement of the Control Data Cyber 170 computer [CW, April 17]:

Rough pricing of the Cyber 170 Series *including* software for typical configurations is 172, $25,000/mo; 173, $41,000/mo; 174, $54,000/mo; and 175, $72,000/mo.

These prices compare on a somewhat similar scale to Cyber 70 systems: 72, $31,000/mo; 73, $44,000/mo; and 74, $70,000/mo.

Rural Ambulance Services Aided

HUNTINGTON, W. Va. – Three university researchers have found a way to optimize rural medical services using a computer.

Thanks to a computer model of a 60-mile diameter area, they were able to cut ambulance response time down to 16.4 minutes, seven minutes less than the previous time.

In addition, the model proved that by relocating, the vehicles' operating costs could be reduced almost $3 million annually.

The computer found the quickest emergency medical service would require 45 ambulances – there are currently 114 – and two helicopters to service the region, much of which is mountainous.

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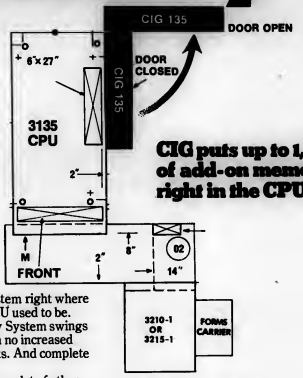

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CW-424

Upgrade Inevitable

Bank Key-Disk Pays Off

By Nancy French
Special to Computerworld

BOSTON – When the First National Bank of Boston's data processing department began to stagger under a sudden 14% increase in workload, accompanied by a 22% rise in costs last year, Kline Ingalls, assistant DP manager, said he realized the bank would lose control of its data if it didn't upgrade soon.

Today that's no longer a problem after the bank converted from keypunch and key-to-tape data entry systems to a key-to-disk system.

Now there is no work to job out, immediately cutting that 22% cost increase experienced last year, and for a 10%

Caravan/74

annual increase in equipment cost, the bank can more than handle any anticipated new work for a long time.

Speaking at a recent Caravan forum, Ingalls explained that when the bank's management decided it was time to upgrade, "it didn't take long for word to get around that we were looking." The bank was bombarded with proposals.

To help sort out the choices, Ingalls developed an evaluation system with the following criteria:

First, the bank took into account the location of each manufacturer to assure ready service and assistance. Additionally, the bank wanted to be sure similar systems were in use nearby for backup, if necessary.

Ingalls also wanted real hands-on experience with equipment prior to purchase.

Core size was another important factor. Was there core to play around with, or would it be taken up by overhead? Could core, disks, etc., be added?

The bank had no intention of getting an albatross, so pricing policy, cancellation charges and an acceptance period were of prime concern.

The bank did not want to be simply barraged with glossy pamphlets and sales presentations. Seeing the system in operation was important.

After testing all comers against these criteria, the bank decided to order two General Computer Systems 2100s. According to Ingalls, the bank is happy with its choice.

Anticipating operator resistance to the new system, Ingalls said he promoted the advantages of the new equipment to such a degree that when the 2100s were installed the operators were enthusiastic.

Communication

The key to successful transition, Ingalls said, was "supervisors who listened to operator complaints that in turn provided valuable input for change." Programmers turned complaints into modified programs that eliminated operators' waiting for work and also eliminated overtime. "Most operators," he said, "became quite proficient on the new keyboards in four or five days."

Ingalls emphasized the importance of an effective backup system with a story about the one time one of the 2100s went down.

"It was last year at Christmas," he said. "We quickly went to cards, put into operation our backup equipment, and we met every deadline."

POS Design Time? Cut it Short

By Toni Wiseman
Of the CW Staff

BOSTON – "Do anything you can to cut short the design time," John E. Greene, project manager for Evans Products Retail Group, told attendees at a recent Caravan workshop on point-of-sale systems.

John Greene

"This will allow you to use the time in systems development where it belongs and you will really need it," he said.

Mail Dependence

In deciding to go to POS, Evans, which is a control company for four nationwide firms, had several objectives, Greene said. These included reducing dependence on the U.S. mail, improving service, speeding information to the home office, reducing the report cycle, reducing home office overhead and paper flow and improving management information.

All these objectives could be met, Greene found, with a POS system which, via telephone lines, would communicate directly with the CPU.

In view of the requirement set for the system, Greene said he considers an electronic cash register more than just a cash register – it is also an electronic calculator, data editor, data collector, data transmitter, cashier aide and strong box.

"Our POS system is nothing but a huge data collection system," Greene stated, "it does no processing per se, except checking and validation."

Two Phases

Greene told attendees to break up their move to POS into two phases – design and implementation.

In the design phase, he said, important steps include talking to other POS users in the specific industry. This will help in determining preliminary economic feasibility and aid in establishing goals for the pilot program, as well as in defining the system in terms of equipment, new forms and telephone requirements.

The installation phase, according to Greene, should include an extensive review of the pilot.

During this time vendors should be selected and negotiations for all contracts finalized.

After all other steps have been implemented, including training, establishment of control and monitoring systems and problem-reporting responsibilities, Greene said, the program must be reviewed on a monthly basis.

After the installation phase, he added, post-installation review procedures should continue.

Maintain In-House On-Line Software? Keep Staff

By Patrick Ward
Of the CW Staff

CHICAGO – Successful use of an in-house on-line systems software package probably depends on keeping the people who originally brought up the system, Dean Bouloukos of Krafteo Corp. told a recent Computer Caravan on-line workshop here.

The best of these people probably want to develop another on-line system, not maintain an existing one, he said.

Additionally, their experience makes them valuable to other companies planning on-line systems.

If they leave, the user of a system developed in-house has to train new people to understand it so they can maintain it.

The user of a widely known vendor-supplied package has less trouble finding people who can deal with problems and change, and so the loss of key staffers won't affect him as much, Bouloukos stated.

Krafteo uses IBM's CICS package in a 1.5M-byte IBM 370/155.

Two years ago, the firm decided to convert from DOS to OS/MVT, TSO and on-line systems all at once, Bouloukos said.

The 370/155 is now driving 135 IBM 3270 Model 2s, which use about 70 IBM 3286 printers.

Additionally, 25 IBM 3780s are used for heavier output. The 3780s are made to look like 2770s for the CICS, Bouloukos noted.

ICC/Milgo 2,400 bit/sec modems are used with the 3270s, Bouloukos added.

Krafteo uses the system for invoicing and order entry. A second, 2M-byte 370/155 provides backup.

Krafteo's CICS has "settled down" after implementation and "is working beautifully," Bouloukos remarked.

But the price is "the heavy core overhead of CICS," Bouloukos also noted that, contrary to what some people expect, once CICS is implemented "you have to build a staff to support it."

Generalized packages are notably less efficient than specially prepared ones, Bouloukos said, but going with a vendor's package has its advantages.

If a user chooses a vendor package rather than building his own, he can direct his best programming talent toward applications, Bouloukos stated.

Vendor packages actually tend to give you better data independence," and also better network independence so that you can more easily add more lines, Boulookos said.

However, if the user modifies a package beyond certain limits, he risks losing the support that is one of the vendor packages' chief strengths, he said. So vendor packages should be carefully matched with the job the user needs done, Boulookos continued.

Krafteo uses its CICS in conjunction with IMS, but did not find IBM support very good for interfacing the two. With this combination, applications can be done "virtually overnight."

Without the data base, new applications were notably harder because there was no common approach between departments in terms of data access techniques, he said. IMS has also cut down redundancies, he mentioned.

A package like CICS provides both simple control and good security for applications, Boulookos added.

However, a poorly organized data base can severely affect response times in such a system, he noted. Response time for inquiries had once gone as high as 20 minutes, Boulookos said, but he said Krafteo is now meeting its goal of response times in the five-second range 95% of the time.

Asked about peak loads, Boulookos said, "The general way of controlling peak times is adding core under CICS."

OCR (a Bit Frightening) Is Really Here to Stay

BOSTON – OCR users "have made every mistake in the book," but despite its problems OCR is here to stay and it can be an inexpensive operation, Jeffrey Langmead of Blue Cross/Blue Shield told Computer Caravan workshop attendees here.

"OCR has had slow acceptance and it's only because we in EDP don't know enough about it and are a little frightened," he said.

Blue Cross/Blue Shield, he said, has three types of applications – type and scan, turnaround documents and direct scan.

"We have one type and scan operation which justifies the cost of all the OCR equipment," Langmead said. "We've realized a $77,000 savings this year, and potential savings for next year could run as high as $130,000, and that's only using the scanner two hours a day."

CW Photos by E. Bride
Jeffrey Langmead explains how OCR handles rejects and misreads.

The savings figure was arrived at by taking the cost of the previously installed key-to-disk system and the salaries for 43 operators – some $315,228 – and balancing them against the new cost of the type-scanning equipment, Selectrics and only 30 operators.

Front-end programming, balancing, error correction, check digits and turnaround documents all must be considered when planning an OCR systems design, Langmead said.

"You have to decide for yourself whether you want your error correction on-line or off-line," he said, "keeping in mind that every time you correct data on-line you have to stop the scanner."

Langmead also touched on the subject of forms, which he emphasized are critical to the application.

Attendee checks out ScanData 2250 data entry system during Boston Caravan.

Home Terminals Coming Slowly

(Continued from Page 1)

audible connections (visual must be on some form of CATV for mass viewing and the telephone company controls the direct two-point audible connection), a degree of coordination is required.

This teamwork is not yet a fact. In addition, the inability of the housewife to physically squeeze or feel the merchandise acts to inhibit this type of transaction.

The second area with potential for home terminals is that of local computation. This has undoubtedly met with failure as the price of "pocket calculators" has dropped and the ability to secure these for home use has increased.

Those programs which previously offered such calculations were inhibited both by the availability of low-cost home calculators and the fact that the basic Touch-Tone telephone is not equipped for other than numeric input. With all-number dialing it is impossible to achieve such added functions as square root and logarithms. This required a special dial. The one telephone manufacturer which introduced this feature five years ago met with failure on the special dial and the associated service.

In addition, any remote service offering this computation ability cannot provide immediate written printouts of the entered items. Therefore, unless the input is being simply verified against already existing totals, the ability to perform these calculations has limited value to the home user.

While the ability to perform computations from the living room or purchase goods from the easy-chair are two possible uses of home terminals, the most expected is the use of Electronic Funds Transfer Systems (EFTS).

Using a Touch-Tone telephone, from the comfort of the home, seemed to offer the first major application of home terminals. Several attempts have been made with little success. The first of these was the master check. In this case the user completed a list of payments to local merchants and utilities. The bank then would take care of the individual payments to the various payees.

No Customer Base

The next natural step was the In-Touch system recently tried in Seattle. In this case the subscriber could use his Touch-Tone telephone to pay individual bills. In the truest sense this would be the checkless society. Yet a major customer base was required in order to justify the system and that just wasn't achieved. The real question is why that base wasn't established.

In order to achieve the customer base it was necessary that the system benefit three groups: the depositor, the merchant

(Continued on Page 6)

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Decision on Greyhound Appeal May Be Bad for IBM

SAN FRANCISCO – A decision on the Greyhound appeal in its antitrust suit against IBM is expected within 60 days and legal sources here feel it could be more bad news for the lawsuit-plagued industry leader.

Legal sources at the recent oral hearing of the appeal indicated the three-judge panel of the Tenth Circuit Court of Appeals appeared to be leaning toward the Greyhound argument that the case should be re-opened for a new trial.

The original trial in the case was dismissed before IBM had to present a defense when the judge found Greyhound had not presented enough information to prove its charge of monopoly against IBM.

However, Edward Foote, the Greyhound lawyer, argued last week that IBM's market position should be considered in light of the lease market for equipment and not all data processing as accepted by the trial judge.

He argued that IBM's price-cutting moves in the computer leasing industry were aimed at destroying the entire industry and that those moves were largely successful.

He also argued that the trial judge should have allowed Greyhound to enter into the trial consent decree signed by IBM in 1956 since the consent decree and the later IBM actions prove the Greyhound market definition.

Judge Walter Craig of the Federal District Court for Arizona had rejected mention of the consent decree in the earlier trial.

He also said IBM lowered the multiplier rate when it introduced the 370 Series compared with the multiplier on the 360, a move, he contended, that was aimed squarely at IBM's competitors in the leasing industry.

For its part, IBM lawyer Frederick A.O. Schwartz, who was backed by lead IBM trial attorney Thomas Barr, IBM counsel Nicholas Katzenbach, IBM Chairman Frank T. Cary, and a host of lesser IBM officials, argued that IBM had not changed its multiplier on equipment with the 370 Series.

In addition, Schwartz argued the entire Greyhound case on market definition had been refuted by Greyhound's own witnesses on cross-examination during the earlier trial which led to the dismissal of the charges.

The "expert" witnesses called by Greyhound in the suit, Schwartz said, were not really qualified as experts and thus their testimony was not binding.

However, sources said after the hearings it seemed that IBM had failed to prove the entire Greyhound case was refuted beyond a shadow of a doubt, leading them to conclude that the appeal court will remand the case to a lower court where it will all begin again.

'Security Onus on Executives'

(Continued from Page 1)

The Safe Report warned that executives must become involved with the issue since the lack of privacy of information in some systems "has become a matter of public concern."

Presently proposed legislation "will make sweeping changes in our present information-processing systems and will specify civil and criminal sanctions for violations of the individual's right to privacy," the report warned.

Who Me?

Executives must become concerned, the Safe group said, since "some of the sanctions proposed will undoubtedly provide for fines and imprisonment for executives and administrators who are convicted of not taking 'reasonable precautions to safeguard the privacy of information.' "

Executives, therefore, "should begin to take action to meet the requirements of the pending legislation" now, the report said, for if nothing is done, they may "suffer the consequences of the legislation when it occurs."

In an executive action program in the privacy area, the report said "a clear definition of what is meant by the term 'information privacy' should be the starting point, because the term is often confused with 'security.' "

The two terms are not synonymous, the report said, because while privacy incorporates all of security as part of its definition, security alone is not enough to provide the safeguards needed for information privacy.

"The problem is more far-reaching than that," the report added.

"Information privacy includes the right of the individual to know that recorded personal information about them is accurate, pertinent, complete, up-to-date, and reasonably secure from unauthorized access – either accidentally or intentionally.

Even if information is completely secure within a system, the report said its very existence could be an infringement on the rights of the subject.

Not Just Security

It is a matter which goes far beyond physical security. The security objective of the organization can be delegated; the information privacy objective cannot, the report warned.

A critical part of information privacy "is the collection of only the minimum amount of information about the subject," the report said, warning that the very capacity of computer systems often "provides tremendous incentives to more and more data."

Executives, therefore, should develop "a thoughtful, long-range analysis of your organization's information requirements . . . keeping in mind that your objective should be to put the very minimum amount of personal information necessary into the system to do the job."

But this is only part of the problem, according to Safe. "The other part stems from the fact that, once collected, the distinction between what information should be public and what information should remain confidential is not always clear.

"This decision requires ethical, moral and legal judgments which administrators may be ill-prepared or reluctant to make," the report said.

"The fact that we as a nation have not adequately formulated our ethical judgments regarding the privacy of information is of little consolation to the administrator who is trying to execute his function as best he can," it added.

Sanders, Univac Suits on Teale May Include IBM in Complaints

By a CW Staff Writer

SACRAMENTO, Calif. – Both Sanders Data Systems and Univac are expected to file amended complaints here this week naming IBM in their suits against the State of California over the Teale Consolidated Data Center contracts.

Both firms had previously filed suits against the state charging the contract awards for the center were made illegally by state officials [CW, April 3, 17].

However, in an initial hearing in Superior Court here, the state argued it could not defend itself adequately if IBM was not also named as a defendant, since the bulk of the $19.9 million contract award went to IBM.

In addition, both Boeing Computer Services and Data 100, which also received parts of the huge contract, may be named as respondents in the case, Sanders and Univac indicated last week.

At present, Sanders said it did not plan to file antitrust charges against IBM, but rather just add IBM's name to the amended complaint.

Sources close to the cases have indicated Sanders might be using the Teale award as a possible testing ground for a later suit against IBM on antitrust grounds since the Sanders' complaint charged state officials accepted an "illegal tying arrangement" proposed by IBM as part of the Teale contract.

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Home Terminals Coming Slowly

(Continued on Page 5)

and the bank. In this case, and at this time, it is almost impossible to meet these criteria.

In normal banking operations the computer is used to its maximum capacity after normal banking hours. Yet this is precisely the time the home user is most likely to want to use the system.

In the case of the depositor, with the exception of the gimmick value of Touch-Tone entry, there is little to be gained. At present, due to banking competition, many minimum deposit accounts with as little as $200 balances offer no-charge checking. Thus the check writer can be offered little incentive in the way of reduced costs to use the service.

In addition, the whole concept of computer entry is still a mystery to the general public and therefore subject to some degree of suspicion.

In this instance the merchant has little to either gain or loose as he collects his money with or without the paper entry. In order to interest the merchant he must be offered something more. This something extra can be the ability to verify the validity of a check presented in payment. Yet this extra, to be of value, must incorporate access to the balances of accounts in all banks. This will require some independent or cooperative organization to maintain a central file for banks. This degree of cooperation is not yet here.

In addition, such a system must overcome the obvious advantage now enjoyed by many check writers of "float" or the ability to cover today's check with tomorrow's deposit. Tests, on a limited basis, of instant payment systems indicated that to be accepted this float must be designed into the system.

When some benefit can be offered to the user and the service offerer, then active marketing of the additional services possible through the use of simple home terminals will be undertaken.

This will undoubtedly happen as the pressure of increasing check losses and high labor costs makes the use of alternative methods attractive to both banker and merchant. With this acceptance the ancillary uses for ordering devices and similar applications will be instituted.

In short, while the rising cost of labor will undoubtedly cause the introduction and marketing of low-cost terminals in the home, the new increased costs apparently coming on the telephone scene will be counter-productive to rapid introduction.

Richard Kuehn is an independent telecommunications consultant.

Atlanta Jews Matched

ATLANTA – The Atlanta Rabbinical Association has found an unusual way to counter the rapid rise in interfaith marriages here – a computer dating service for Jewish men and women.

Rabbi Donald Frieman, president of the group, said Atlanta had become a center for Jewish singles but he felt there were too few opportunities to meet those of their own faith.

The Jewish Compu-Date service matches would-be companions in 60 categories including philosophy of life, conformity to social standards and attitudes toward sex. Frieman said a Philadelphia firm is matching the profiles to assure privacy.

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Used in Laboratories

Missileless Machines Launch New Role

BELOIT, Wis. – Two Beloit College students here are giving civilian roles to guidance-control computers once housed in Minuteman I missiles.

John Glaberson and George Ronkin take these computers, originally designed to steer defense missiles to their targets, and rework them into small independent computers for laboratory use.

Beloit College is one of some 150 institutions involved in this U.S. Air Force program to salvage electronic instruments from obsolete nuclear missiles and to give students first-hand experience in hardware and software computer technology.

The Air Force built more than 1,000 of these missiles in the early 1960s, but development of more advanced weaponry has replaced Minuteman I. Faced with the choice of junking the computers, worth $240,000 each, or donating them to some worthy cause, the Air Force decided to give them away.

Institutions became eligible for the computers by qualifying for National Science Foundation grants and paying the required shipping costs – about $100 per computer.

Beloit has received four computers so far, and each has arrived in the same state. "We usually get the nose cone of the missile and then have to strip it down to the parts we want," Ronkin explained.

After the outer skin of the cone is stripped, the guidance components must be removed from the computer, leaving a cylindrical mass of circuits and transistors about half the size of a 50-gallon oil drum. Electronic equipment is then built to adapt the computer to laboratory use.

"I was pretty flustered the first time I tried to build the necessary equipment," commented Glaberson. "The computer was big and complicated and the 20 or 30 pounds of manuals that came with it weren't helpful.

Relying on literature put out by the Minuteman Computer Users Group, a consortium of the institutions using these computers, Glaberson soon overcame the electronic obstacles and wired the computer to a power source and a teletypewriter, making it ready for programming.

"We couldn't use a high-level language like Fortran with the computer," Ronkin said, "because it was built to guide missiles and not to talk. So I wrote a primitive language processor for it using the college's IBM 1800 computer."

Once rebuilt, these small independent computers can be used anywhere from the physics lab, as small particle counters, to the psychology lab, as laboratory process controllers.

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Police Plan to Build Crime Crystal Ball

SPRINGFIELD, Mo. – What local officials call a "technological crystal ball" is in the planning stages here.

Assistant Police Chief Les Reynolds said the "ball" is a computer project that will tell police where, when and what kind of crimes may occur so they will have enough men assigned in the right spots.

"We hope to collect, organize and store data pertaining to police and criminal activity," he explained, "then we will compare community and population information. We will relate our requests for services to land use, population density, the types of buildings and structures, the time of day, time of week and month." Also, an analysis of growth patterns and changes in criminal activity will be carried out periodically, he added.

The project will be effected under the guidance of the city police, a city utility computer and a Southwest Missouri State University student specializing in data processing.

A Solution on the Rocks

NEWARK, Del. – A local newspaper editor recently adopted a new slogan and tacked it to his wall: Beware of Drunk Computers!

The problem started when the *Weekly Post* here ran out of denatured alcohol used to clean the lenses, contacts and switches of the computer that justifies the paper's columns.

To remedy the situation, the editor grabbed a bottle of gin and proceeded to prime the machine, and as a result, the *Post* appeared in double-vision, literally.

Welfare Savings Seen

FT. WAYNE, Ind. – An estimated $200,000 a year will be saved because the Allen County Welfare Department here has decided to computerize, according to the welfare director.

The system will verify names, Social Security Numbers and addresses of new applicants to determine whether records already exist.

This will alleviate duplication, noted director John Heiny, and "provide a really big boost" to the task of reducing errors in payment.

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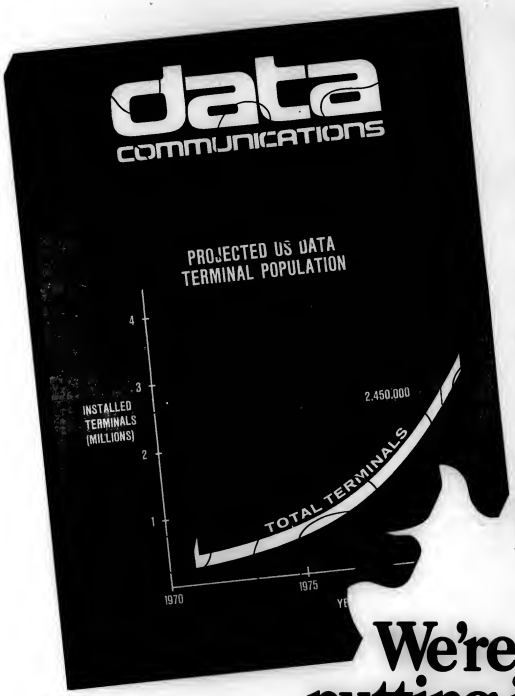

Data communications is indeed a puzzle to most of the people working in the market. In fact, many don't realize that they have data communications needs or what their needs are.

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Editorial

Less Export, More Control

On April 10 the Technical Advisory Committee to the Office of Export Control concerned with computer systems, components, peripheral geer and test equipment, met at the main Commerce Building in Washington. Rauer Meyer, head of OEC, admitted under direct questioning from the press thet he was personelly classifying the committee reports. He then stalked out of the room, not returning during the open session.

Representatives of *Computerworld* end *Electronic News* protested continued classification end celled for releese of at least the committee's recommendations. Our editorial director pointed out that hundreds of industry firms and thousends of user companies and individuals are not cleered to read the classified meterial. Honeywell, IBM, NCR end Control Data have participated in the work, end have full access to the results. Software houses, peripheral equipment menufecturers, the user community, the professional associetions do not.

The mejor companies have e stake in easing export controls. Unfortunately, they elso do e very large Pentegon business. A microprocessor menufacturer who wents to export and who doesn't have to suck up to military procurement would better represent industry and user needs.

The DOD/CIA/NSA veto, and veto it appeers still to be, is exercised by Ron Finkler. He said nothing during the open meeting – just smiled. When Meyer left, he smiled. When Sid Fernbach's absence was noted, he smiled. When CW and EN threetened to invoke the Freedom of Informetion Act, he smiled. When e new subcommittee on technology transfer was announced, he smiled. Broadly! He hes much to smile about.

A Letter to Honeywell

A "stockholder," Clergy and Laity Concerned (Calc), has given notice that it intends to present two proposals to the annual meeting of Honeywell, Inc., which will be held in Minneapolis May 8. These proposals by clear implication deprecate Honeywell involvement with military command and control, and – repeating complaints from Calc, Computer People for Peace, and others in past years – Honeywell manufacture of "fragmentation and time-delay weapon systems."

This has been a matter of very deep personal concern to me for several years, and has appeared as an artifact in many of my speeches in this country and abroad. On the other hand, I want to use my position as CW editorial director constructively, and keep rewnlly close to data processing concerns. Trying to balance the two urges, I have sent the following letter to the chairman of the Honeywell board:

Mr. James H. Binger
Chairman of the Board
Honeywell, Inc.
Minneapoiis, Minn. 55408

Dear Mr. Binger,

As the first executive to go to Phoenix to begin what is now an important part of the Honeywell data processing activity, and in view of personal friendships with many of your senior technical and management people, I am concerned about the Honeywell image. As a computer pioneer and as an editor of a major trade paper in the business, I am concerned about how the public regards the machines, the programs and the people in the information field. I want Honeywell computers to do well, and I want Honeywell systems and people to be respected, warmly regarded.

The two stockholder proposals described on pp. 32-34 of the notice of your 1974 annual meeting deserve sympathetic and concerned attention from you, from the other members of the board of directors, and from your executives. It is not enough in Watergate America to be legally correct, to be businesslike. It is not enough in post-energy-crisis America to be profitable. Honeywell's reputation will suffer unless you improve your stance, unless you appear to be as humane, as ethical, as concerned as – let me be blunt – IBM.

We both know that management decisions are usually hard-nosed. Yours, on Wimmix matters and on the mass production of anticivilian weapons, certainly have been. In the data processing arena, most customers will make their final decisions on a similar basis: the bank president, the controller of the multinational or overseas industrial organization, will choose Honeywell or Univac or IBM on cost-performance, tempered by considerations of service quality, follow-on developments, survivability.

All very tough; whether you make flechette bombe or sell in South Africa doesn't come in at all.

Parenthetically, I regret this very much – think it good, not foolish, for businesmes to be moral, as well as enterprising. But the decision process is almost always as I deacribe it; if tempered at all, it is by interpersonal factors ("Bob is a *great* salesman") rather than by ethics.

But, Mr. Binger, the bank president and the controller choose among options presented to them by middle managers and technicians. These men and women are not moral paragons; they are not better Christians than their bosses. But they are not nearly so motivated to be profitable, to be hard, to be unethical. Many computer people, especially in the software and user communities, are deeply concerned about abuses attributed to their tools and their profession. The options presented to the top decision makers will, I believe, frequently reflect any distaste or distrust technical people feel for your company.

I am aware that Control Data and Univac and DEC and IBM all work with the military, and on beastlier projects than general-purpose computers. You, however, are definitely frontrunner in the Ugly Computer Corporation sweepstakes; it may be unjust, but we both know it is so.

One more argument, please. There are many good computer professionals – not a large percentage, but still, many hundreds of men and women – who will not work for Honeywell. In a field as demanding, as competitive as data processing, it is dangerous to cut yourself off from vigorous, concerned contributors. You need them; when they go to a software house or IBM, you lose.

I realize your stance is popular with the Pentagon. But the big market for you, and by far the more profitable market, is out among human beings. May I solicit your cool, business-mode attention? Sales and profits run along with humane concerns, sir.

Honeywell can do better. Honeywell can look better. Honeywell would *feel* better! Please, change your position.

Very sincerely,

H.R.J. Grosch
Editorial Director,
Computerworld

'Not to Worry – If You Flunk Out, You Can Always Open a DP School'

Letters to the Editor

Two Easy Steps To NCR Conversion

Regarding comments made by Herb Grosch in the "Letters to the Editor" column [CW, April 3] on a letter about the story on small systems [CW, March 27]:

As an ex-NCR systems analyst and salesman I am well aware of the upgrade capabilities within the NCR Century line. They are real, easy to understand (if one takes a minute with an open mind) and are 100% effective.

In upgrading from an NCR 100 to an NCR 101 you can take two easy steps to effect the conversion. First, remove the disk packs from the disk units, take out the NCR 100, move in the NCR 101, remount the disk packs and run. This assumes disk unit compatibility; if not, then a disk copy must be done. Now that we are running, the second step should be taken: As time permits, recompile all programs with control card changes indicating an NCR 101. The recompile will take advantage of additional hardware capabilities that the NCR 101 offers.

I certainly don't accuse *Computerworld* of being pro-IBM; however, you seem to think that because IBM cannot upgrade equipment without costly and time-consuming conversion that everyone else must also do the same. Too many people in this industry have fallen into the "IBM way is the only way" trap!

W.M. Harris
Sales Representative
Control Data Corp.
Bethlehem, Pa.

Computerworld welcomes comments from its readers. Preference will be given to letters of 150 words or less. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

Aussie Placement Firm Explains Whys, Wherefores

By Gordon Hooper
Special to Computerworld

I would like to reply to a letter in the March 27 issue, "Think Twice Before Going Down," as we are obviously the agency referred to.

The use of a form letter reply to our ad respondents is regrettable but necessitated by the overwhelming response we have had to date. We send the form letter only to people whom we judge to be readily employable in Australia based on how they present on paper.

Rebuttal

The writer's first point is well-taken, but we do not solicit money from anyone.

Because so many Americans who come to Australia end up returning home (Americans have the highest return rate of any national migrant group) – and this point is the main reservation Australian companies have in hiring Americans – we offer a Career Guidance Service "to help you decide about moving" (quote from our form letter).

Job Searches

This includes job searches for applicants as well as general information of interest on living and working in Australia. We offer this service even though it takes up to two man-days of research by our professional staff to compile a Career Guidance Report, and the $75 that we charge (nominal when one considers that the standard consultant's fee here is $45/hr!) "will be refunded in full if you let our company handle your actual job placement in Australia (company-paid placement fees are our primary source of income)" (quote from our form letter).

The form letter also makes it clear that we provide certain free services to any of our applicants, regardless of whether they have subscribed to our paid services. These include, upon receipt of a person's arrival information, arranging initial accommodations and meeting him at the airport as well as scheduling interviews with prospective employers.

Officially Speaking

For the second point regarding one's acceptability in Australia, we do not purport to be official spokesmen for the Commonwealth Government, but do go on to say in our form letter, "... concerning visas, assisted passage, etc., we suggest you contact an Australian Government representative at ..." and we type in the address and telephone number of their nearest Australian Consulate.

We can and do comment on a person's employment prospects in Australia, which we are well qualified to do as we are in constant touch with hundreds of companies here and are very aware of their personnel needs. Immigration, however, is a private matter between the individual and the government.

Gordon Hooper is chairman, American-Australian Executive Placement Pty. Ltd., G.P.O. Box 1886, Sydney, N.S.W. 2001, Australia.

Letters to the Editor

About 'IBM Problem': Get Strong Competition

The debate regarding how IBM should be broken up has disappeared from the letters column recently.

As a user of IBM equipment (and some competitive equipment) for 16 years, I have formed the following opinions:

- IBM captured a dominant share of the market through outstanding marketing and service.
- It is now so dominant that it is no longer necessary to provide the same level of service.
- Neither crying nor screaming will cause IBM to offer better service. I have tried both. The only thing which will move the giant is strong, viable competition.
- There is no justification for any action to make any existing company more competitive unless it can do it itself in a free market. If it can, bravo; but I'm unwilling to suffer the consequences of having IBM brought down to the level of the seven dwarfs.
- Still, competition would be good for users, the country, and, in the long run, for IBM. Therefore, why not divide IBM into two companies? One could be built around the 370, the other around the System/3. The separation should be complete including separate stock and boards of directors. The S/3 line could be extended upward and the 370 downward and after a relatively short period, the forces of competition should be at work.
- This would provide no help to other computer manufacturers or peripheral equipment vendors. There is no justification under law for helping anyone be more competitive; only for assuring that competition exists. I believe this proposal would assure competition while damaging no one. Most important, it would not damage users (that's me!).

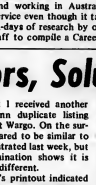
A.W. Holtsberry
Columbus, Ohio

Errors, Solutions Unrelated in Problem of Duplicates

This week I received another Colonial Penn duplicate listing from Robert Wargo. On the surface it appeared to be similar to the one illustrated last week, but closer examination shows it is really quite different.

Last week's printout indicated some of the ways the same address could occur in a name and address list, and how these had to be resolved by pairing them for human inspection, rather than simply programming the computer to use standard rules.

The Taylor Report
By
Alan Taylor, CDP



This week's printout indicates the types of errors which can create the duplicates.

The list is interesting, including both human and computer-related problems. (It also involves one serious ethical problem for a third party performing a confidential comparison of two lists, such as screening the *Computerworld* subscriber list against a promotional list. If anyone can spot the problem please write to me.)

On the machine-related side, there is the obvious reference to equipment in the confusion of 277/217 of case 7, and the use of different standards (one human, one machine-oriented) in the compression of 25 W 148 into 25W148 in case 10.

Examples of hybrid human/machine errors are shown by the 145/U45 confusion in case 5, where the machine's need for a numeric key led to a human failure, and by the machine operator's misreading of 15608 in case 14.

Totally human problems can appear both inside and outside the computer area. An inside problem is shown by case 6, in which one operator keyed CHAS while another keyed CHARLES, and one shortened MAPLE CROFT while the other didn't. This may well be a professional problem. To provide effective data entry as cheaply as possible, the professional operator reasonably has the right to choose between different versions – which also guarantees there will be differences between two keypunchings of the same data.

Outside the computer area, the spoken transmission of names (case 12 – NEILSEN, NEILSON) again indicates the input is realistically always going to be "dirty" – even if we standardize in our own areas to eliminate our own errors.

A look at the problems quickly indicates that the method of handling has only the slightest direct relationship to the way the problem occurred. A keypunch error is not solved by searching through the microfilm banks for the original keypunch document – nor does handling NICK, names and nicknames, etc. The length of strings of identical characters is involved in developing matches, as in the nature of the differences – which led Mr. Wargo calls the Common "S" and "5" misinterpretation in case 14, or case 8's "A"/"O" problem.

Table look-ups, string lengths, and difference analyses are all very precise points but they are fundamentally unrelated to the nature of the problems themselves. Recognition of the A/O syndrome will never eliminate poor phone transmissions of namet. And you don't know how many partisans of Semple is infected by poor transmissions. Some better way is needed by users of unduping services to have a really good grip on effective unduping performance.

This means that while guidelines like 2% found dupes between random matching of files may provide rules of thumb of the quality of a file and a cleaning process, they are really technically unsatisfactory.

Instead the cleaning should be defined as permitting detection of two- and three-position transpositions, of number truncations by single digits, of compressed fields.

At the same time the files concerned should be identified as having certain proportions of apparent dupes by tape – not just by gross. Then a user could expect to be able to have a real choice about where to take his files for cleaning, knowing just what will be detected. Users need this type of real information if they are to be able to show why the files they control need and can afford to be kept clean.

	NAME	STREET ADDRESS	
1	MARY M BLAND JR M M BLAND	30 COLBY AVENUE 30 COLBY AV	
2	SARA E CLINE SARE E CLINE	1300 HARRISON ST 100 1300 H MARRISON 8100	
3	VINCENTE DOSADO VINCE A DOSADO	1606 ZEBLEY ROAD 150 ZEBLEY RD	
4	F I EVANS FRED I EVANS	765 CLAYMONT GARDEN 507 CLAYMONT GARDENS	Transposition error
5	HOWARD L FOLLES HOWARD L FOYLES	R 1 BOX 145 R1 BX 145	Keypunch error – failed to depress "numeric" key
6	CHAS L HAMMUM CHARLES L HAMMUM	MAPLE CROFT ROAD MPLCRFT BOX 110 RD 1	Fact: Different keyers will key differently!
7	MARLOW L HASTINGS M L HASTINGS	BCK 277 GOV-AV BCK 217	Keying error or optical scanner failure
8	DEL HOWARD MD DELBERT HOWARD	402 FAULK ROAD SC 402 FOULK RD SC3	Common "A" vs "O" syndrome – e.g., Faulk
9	MICHAEL J LUEDKE MIKE J LUEDKE	BCX 2455 STA A STA A BX 245	
10	JOHN MC MEELEY JOHN P MCMEELEY	25 W 149 DENISE AVE 25W149 DENISE AV	Alphanumeric compressed field
11	GEORGE MITRAPULOS G C METROPULOS	23 CLOVER LANE 23DI CLOVER LN	
12	S E NIELSEN S E NEILSON	2605 MILL PLAIN #13 2605 MILL PLN BLVD 13	Misinterpretation of sound, i.e., telephone
13	EDWARD REHTZ EDWARD A REHTZ	BCI 1-2 SE-6TH BCI SE 6TH	
14	THOMAS L SMCATTKE THOMAS L SCHATTKE	1 S 600 DEMBERT ROAD 15608 DEMBERT RD	Common "S" vs ":5" misinterpretation The "2" was probably keyed in the field to the left of street at data transcription time.
15	WILLIAM E STAEGO BILL STAEGO	204 DAKOTA AVE 04 DAKOTA AV	

This listing of suspected duplicates within a city/state/Zip Code category shows a number of ways in which human and machine errors, and human professionalism, can cause problems in the removal of duplicate addresses in automated mailing operations.

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Letters to the Editor

B1726 Advantages

Rate Much Praise

In reference to "Small Non-IBM Users Happy, Despite Initial Doubts" [CW, March 27], I feel something else must be said about the Burroughs 1726. Our installation was also *one of the first* and we had our problems as we well expected to have since the B1726 was a new product line. Our downtime was considerable during the initial period of installation; however, this did improve and the supportive services of the Burroughs staff were "on top of the situation" during this trying time for all concerned.

At present, downtime is minimal and our work is processed on time with no extra effort. This is not to say that a problem does not crop up every once in a while, but on what computer system does it not occur?

It is our judgment that the software for the B1726 is superior to any other in the marketplace at the present. Release 3.2 of MCP II has proven very efficient and easy to utilize. An example of this would be the fact that during a period of seven eight-hour working days, 463 separate jobs were processed through our system. These jobs varied from Cobol compilations to payroll check production. It does take time to break away from the "IBM way of doing things" and eventually one feels more and more comfortable with the Burroughs software after working with it from day to day.

My criticism of the article has nothing to do with any "allegiance" to Burroughs. Besides having the B1726, we also have an IBM 1401 in use in our school system.

The decision to install a B1726 was based on the evaluation that the B1726 was far advanced of anything offered at that time, could accomplish what we wanted, and offered future system expandability without having to change to another system.

In summary, the B1726 has far exceeded our expectations. We have had our problems and will no doubt have others as we continue to grow with the system. We feel the advantages of the B1726 exceed the problems that we have had in the past or might encounter in the future.

G. Lee Mills, Director, MIS
Jefferson County
Board of Education
Birmingham, Ala.

NCR Upgrade for Real

Computerworld's response to Evelyn Thomas's letter, in regard to the ease of upgrading from an NCR Century 100 to a Century 101, seemed to possess an element of skepticism [CW, April 3].

In September 1973, our department made such an upgrade. We not only went to the 101 processor, but changed from 655 disk drives to the higher-capacity 657 drives. The conversion was completed in one afternoon and consisted of the following: Creation of a master software pack and initialization of six 657 packs. Next, using NCR quick disk copy routine, we copied our 655 packs to the 657's stacking up to four 655 packs on a single 657 pack.

At that point, we were in the middle of closing the company's books for the preceding month, having completed approximately one half of our processing on the Century 100. Since we experienced no difficulty in copying our programs and files from the 655's to the 657 drives, we decided to go ahead and attempt to complete our processing using the new 101 – *not a hitch.* All processing was completed normally.

We had intended to run parallel on the 100 and 101 until we were sure the 101 was functioning properly, no matter how long it took. Like you, we too had a little healthy skepticism, but after two days we made arrangements with the local NCR branch to have the 100 removed. Since installing the 101, we have reduced our machine time approximately 18%.

Therefore, based upon our experience, I believe Thomas is correct in assuming her programs will run on the 101 with no reprogramming required.

G. Daniel Green
Assistant EDP Manager
Lowes, Inc.
Cassopolis, Mich.

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Letters to the Editor

Reality Dims The Eyes of Hope

The column by Herb Grosch in the March 27 issue, titled "Contrast," reminded me of the vast disparity between our hopes of a dozen years ago and the realities of today, which I experienced recently on reviewing notes of a talk I gave then.

The talk was to the freshman class of the University of Wisconsin in Milwaukee and dealt with technology in the 20th century.

It was laced not so much with wild-eyed optimism but with what I thought then, and would retroactively again think, were reasonable projections of the impact computers would or could have. Needless to say, they were all beneficial.

Within 24 hours of having reviewed those notes for a variety of reasons, I read a copy of *Saturday Review – World* in which Norman Cousins stated:

"The new technology has produced the theoretical base for the greatest liberation from drudgery in human history, but the pervasive effect so far is not new options by the quantification of human life."

I have been reeling from Cousins' observation since. Clearly, while he misses a tremendous amount of the success and the value of computing to our society, he nonetheless hits squarely on the mark and probably accurately reflects the opinions and the frustrations of the majority of our American colleagues.

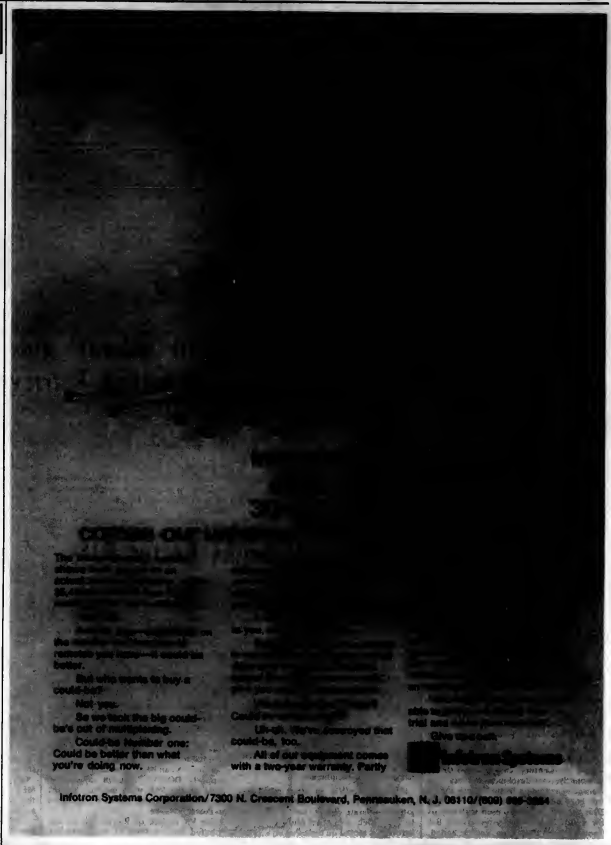
I must close by saying that it is, as I think you have reflected, very, very hard to look back to the history of our business and be particularly proud.

Robert J. Robinson
Albany, N.Y.

First Things First

In the article by Jon David, as to compatibility, David's analogy to "being 1% pregnant" was funny, but not accurate. Lacking any standard for RPG II, it is most difficult to define. Most minicomputer manufacturers use Ascii rather than Ebcdic code; thus, they are automatically not "compatible" across-the-board. But when a system of seven programs can be moved from an IBM S/3 to an Lockheed System III in 1-1/2 hours, that strikes me as being fairly reasonably compatible.

F.R. Weinberger
Los Angeles, Calif.



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Random Notes

Burroughs, IBM Gear Uses Ledger Package in Cobol

CHICAGO – A new, all ANS Cobol version of General Ledger and Financial Information for Banks has been released by Financial Technology, Inc. for use on either Burroughs and IBM mainframes. The new version expands the cost allocation and budget preparation aids available to the user. It continues to support user-definitions of financial statement formats.

The system runs in a 44K partition on IBM 360/370 equipment or a 33K partition on "any Burroughs system that supports Cobol." The package can be purchased for $10,000 from the vendor at 612 N. Michigan Ave., 60611.

Pars Support Added to 'FDR' Useful to Airlines, Banks

CLIFTON, N.J. – IBM 2314 disk packs created under IBM's Pars operating system – used by airlines and financial institutions alike – can be dumped in two or three minutes, with a special option to the Fast Dump Restore (FDR) utility package now available from Innovation Data Processing.

To use the FDRPARS feature, an installation must also have FDR itself ($1,190) and the Data Set Functions (DSF) option ($800). The Pars option costs $2,000 for the first CPU, $1,000 for each additional unit, a spokesman said from 925 Clifton Ave., 07013.

Astrology Calculations Eased With $30 Package From Hindu

SAN FRANCISCO – Astrologers can determine the exact moment during any given month at which the sun and moon have a particular angular relationship to one another, with a $30 program from Computronics.

Calculating these "solunations" manually is time-consuming, the company noted, because the sun and moon travel at different speeds. This new program, developed with help from a Hindu astrologer, "can spew out the answer" in seconds, a spokesman claimed. Written in PL/1, it requires 256K on a 360/50 or larger CPU, Computronics said, from 176 Page St., 94012.

Smaller Century CPUs Can Use Latest Version of Total DBMS

Although original plans for the NCR version of Total ICW, April 171 called for its use on Century 251 and 300 CPUs, Cincom Systems dcveloped the data base management system in such a way that it can bc used on 64K Century 101s and 200s as well. It can be used with any of the Century operating systems, from B-1 through B-4, a Cincom source added, from 2181 Victory Pkwy., 45206.

Mark IV vs. Cobol

Programming, Runtime Tradeoffs Seen

By Don Leavitt
Of the CW Staff

MANSFIELD, Pa. – Mark IV takes only one-third as much time to program as Cobol and requires less machine time for testing. Machine efficiency for production runs, however, favors Cobol over Mark IV by a 2:1 margin, according to a recent user evaluation.

The study was based on controlled use of both languages on the same jobs at the Computer Educational Center, Mansfield State College, and was very limited in scope. But results were conclusive enough so center director Dr. Jack A. Chambers recommended acquisition of Mark IV for use at all Pennsylvania state colleges.

Mark IV would supplement and not replace Cobol under this plan. Much of the colleges' work is either student-oriented or special-purpose reports, Chambers reasoned, and these activities benefit from ease of preparation without being badly impacted by inefficient execution, since the jobs aren't intended for regular production.

Mark IV can be learned more easily than Cobol and used directly by people outside the DP staffs, Chambers added. Making Mark IV available to end users "could save enormous amounts of time in most centers and, perhaps more importantly, result in satisfied users."

Although "bugs" are still evident in the Mark IV Mansfield uses on its TDOS-oriented Univac 70/3, the system support group at Informatics gives "quick action on problems," Chambers' report noted.

The study, made this February, was limited, overall, to two weeks. The scope of the evaluation was further restricted, even while its objectivity was enhanced, by having each job coded twice, by each of two persons, or – phrased another way – the system had to be small enough to be coded twice by one person in two weeks.

The study used two systems analysts/programmers who had nearly the same skill and experience in both Cobol and Mark IV. To control for individual differences, each implemented the system in both languages but in reverse sequence.

Chambers broke the project into five segments and clocked programmer efficiency in man/minutes of effort, and machine efficiency in CPU seconds. Measurement of the three major segments – data base creation, data base maintenance and report generation – was further broken down into coding and testing times (for programmers) and testing and production times (for machines).

Documentation, defined as the organization of the specialized knowledge necessary to run the system, was measured only in terms of programmer "coding" time, and "clocking" of program maintenance was limited to the three timings short of production.

Totaling the programmers' times for both coding and testing in all five segments, Chambers found the Cobol effort took 1,137.5 man/minutes while Mark IV took only 339.0, or a ratio of Mark IV to Cobol of 1:3.4.

Totaling machine times for testing the two systems showed Cobol took 1.4 times as long as Mark IV. But the totals for production reversed the earlier patterns and showed that Cobol jobs ran twice as fast as Mark IV.

$750 'Mirads' Aids Univac 1108 Information Retrieval, Display

ATHENS, Ga. – Univac 1108 users operating under Exec 8 with DCT 500 or Uniscope 300 terminals can extract and process information from multiple data files with the Marshall Information Retrieval and Display System (Mirads) now available from Cosmic.

Mirads is a command-driven system, with on-line editing of user entries, which provides diagnostic messages and recovery procedures if the need arises. The system can process any number of files, as long as each file's structure is described in a file dictionary.

The package includes two primary subsystems, Search and Retrieval (S&R) and Direct Access Data Display Subsystem (Dadds).

S&R allows the user to scan through entire files, looking for records that fit ranges of values, for example, rather than specific, closely defined values. This subsystem can sort the requested files into a specified order, perform simple or complex computations on the data, updating it or displaying the results.

The Dadds portion of Mirads provides a capacity to access data files for specific record types, to process the data thus located and to present results as specified by user commands and output formats. It works with indexes, rather than the full files, but allows users to move to different levels of summarization, with a simple keyin.

Data might be requested on a department level, first for example, and then on a division level so the user can review the subsidiary's figures in light of the larger unit.

Mirads is written largely in Cobol, with Fortran V and Assembler used for about a third of the coding. The entire system includes approximately 23,500 card images, but a spokesman at Marshall Space Flight Center said it requires no more than 32K to run any of the programs in the system.

Officially listed by Cosmic as MFS-22536, Mirads is available for $750; the documentation for the system costs an additional $24.50.

Cosmic, a clearinghouse of government-developed software, is at 112 Barrow Hall, University of Georgia, 30602.

'Power/VS' Gains Better RJE

WHITE PLAINS, N.Y. – Overcoming Power's need for substantial dedicated main memory, a frequent criticism of the spooling software, IBM now plans to have a virtual storage version of the utility available in September.

Power/VS will operate under DOS/VS and will continue concurrent spooling of input job streams from card readers and terminals and output for card punches and printers. But the degree of operator and system control of the spooling process has been enhanced "significantly," IBM said.

Spooling refers to the movement of data to an intermediate high-speed storage device, usually disk, so that the operation of the computer itself is not degraded by relatively slow peripherals.

Under Power/VS, an input scheduling feature allows users to assign incoming jobs to separate classes, and, in addition, to give each job a scheduling priority before it is stored on disk. Power/VS then processes jobs according to class/priority rather than merely when they entered the system.

The repackaging of Power also includes a "full range" of operator commands that allow greater control over tasks as they move through the system, and an approach to job accounting that combines the separate tacks previously followed by DOS and Power, IBM said.

A segmented feature is new, the vendor went on, explaining that by dividing large volumes of stored output into segments (of VS page size), so that printing or punching can begin before the job producing the output has finished executing.

For remote users, Power/VS has increased support from five to 25 concurrent communications lines.

Power/VS can be used on IBM 370s that support DOS/VS, though apparently none of the 96K main memory needed for that environment has to be dedicated to Power.

The VS update of Power will be distributed free to DOS/VS users who ask for it, IBM noted.

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1130 Fortran Moved to HP 3000 For Use From CPU or Terminals

PALO ALTO, Calif. — Fortran programs originally written for the IBM 1130 can be run on Hewlett-Packard 3000 Series CPUs after being processed through a conversion package now available from HP. The conversion process can be executed from interactive terminals or batch input devices, the company said.

Since the HP 3000 is a multiprogramming system, as many as eight Fortran programs can be converted concurrently, depending on user configuration. The converted program can then be run in interactive or batch mode, even if it was batch-oriented on the 1130, HP added.

The conversion software is also useful in adapting IBM 1800 Fortran programs to the HP system. An on-line editor enables users to change data files, program statements and the sequence of program logic to take advantage of the architecture and I/O structure of the HP 3000, the spokesman said.

The free conversion program runs in the basic HP 3000 configuration, with a 96K-byte CPU, included in systems now being shipped, it can also be acquired by present users or utilized at HP data centers.

'Toads' Supports School Managers

PALO ALTO, Calif. — School and college administrators can run management tasks on Hewlett-Packard systems even while students and faculty are using the same systems for computer-assisted instruction (CAI) or problem-solving, with the Terminal-Oriented Administrative Data Systems (Toads) from HP.

Toads encompasses three separate application systems that run on two different HP hardware configurations.

The College Information System (CIS/2000) permits HP 2000F users to build and maintain a student data base, register students and process grade reports via an on-line, interactive system. The data base is consistent with standards set by the National Center for Higher Education Management Systems, HP claimed.

The Student Information System (SIS/3000) enables schools with HP 3000s to set up comprehensive, integrated data bases of all families living in their districts, to distribute student grades and to report student attendance records. SIS/3000 can be in batch mode or from terminals.

Admin/2000F supports school districts and small colleges in financial budget recordkeeping and handling staff payroll.

Both Admin/2000F and CIS/2000 run on HP 2000F systems with two HP 2100 minicomputers and 24M-byte disks. They are similar, too, in that they are most efficient when used with populations of 10,000 students, according to HP.

CIS/2000 will be available in October for $7,500 under a licensing agreement. Admin/2000F will be ready in August, the company added, and will cost $8,000.

SIS/3000 requires an HP 3000 with 128K bytes of main memory, a 47M-byte disk, mark-sense card reader, terminals and a line printer.

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Sherry Says...

The Data Communication Forum

Sometimes a data communication system can work too well. That may sound like heresy, but that's how Ron Mitchell, ICC's engineering director for systems last when a new ICC system in Japan operated without a hitch. Ron was counting on being called over to debug the system. The quick start-up spoiled his plans for a vacation in the Far East.

Engineerese — Overheard at an ICC engineering meeting: "Our 2400 bps MOS/LSI 4-level DPSK modem improves WTBF on DDD with EIA RS-232C, CCITT V.24, or MIL STD 188 interfaces at CPU's, DTE's and CRT's." . . . And now you know why the engineers don't write my scripts.

Showbiz. Communications people will really be "on the road" the week of May 5th. While ICA members and guests are at their conference in New Orleans, other communication types will be at the National Computer Conference in Chicago. Which show will we attend? Why both, of course! We'll do it with modems . . . and mirrors.

If you have questions or topics you would like to see in our column, send them to: "Sherry Says" c/o: International Communications Corporation 7620 N.W. 36th Avenue Miami Florida 33147

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COMMUNICATIONS

Data Briefs

Teleprinter for Telex Users

NEW YORK – Trans-Lux Corp. has a teleprinter for Telex users that includes an electrostatic storage of 2,048 characters to eliminate the paper tape used by most users.

The teleprinter is described as one of the first to take advantage of Western Union interconnection tariffs that allow the use of non-carrier equipment on Telex, according to the supplier.

The TLT terminal matches present Telex speed of 66 word/min but message preparation and editing can be done at twice that rate with the built-in storage.

Instead of the rotary dial on a conventional Telex terminal, the TLT uses the keyboard to call the receiving station. The unit is priced at $55/mo, which compares with present rates of $49.50/mo for a WU Telex terminal. But the carrier has asked for FCC approval to increase its monthly rate to $56.50, according to a Trans-Lux spokesman. The company is at 625 Madison Ave., 10022.

VMF Has Ascii Terminal

BAYSHORE, N.Y. – VMF Industries, Inc. has a 32-character buffered alphanumeric display terminal for $875.

The terminal can transmit in Ascii code at speeds from 110- to 1,200 bit/sec in either full-duplex or half-duplex mode. The unit includes a 10-key calculator-style numeric key cluster in addition to eight alpha or control keys which can be programmed for a variety of functions.

The TR-10 can be interfaced with cassette storage buffers, floppy disk devices and other RS-232-compatible peripherals. Main applications for the TR-10 are expected to be inquiry operations such as credit authorization and production control, the firm said. The TR-10 can be used in polled multidrop sets and it is available for 30-day delivery from 216 N. Fehr Way, 11706.

Display Terminal Under $3,000

CORNWELLS HEIGHTS, Pa. – The Delta 5500, a lower-cost version of the standard Delta 5200 video display terminal, has been announced by Delta Data Systems Corp. for under $3,000.

The terminal incorporates as standard features three formerly optional features offered for the Model 5200, including a 2,048-character buffered memory, communications speeds up to 9,600 bit/sec, and bit-parity checks without response.

A Paging feature permits display of all characters in memory (optionally up to 3,072) – regardless of line widths – in any format, without computer memory or regard to the number of lines of information transmitted.

Delivery of the Delta 5500 is 90 days from Woodhave Industrial Park, 19020.

Improves on CTMCs

CCP Front-Ends Univac 1100s

CLEVELAND – A front-end processor specifically designed for the Univac 1100 Series has been introduced by Chi Corp.

The Chi Communications Processor (CCP) system can replace one or more Univac Communications Terminal Multiplex Cabinets (CTMCs), according to a spokesman, and it can also be used as a remote communications concentrator. It is said to save 20% or more over other configurations, while providing added capabilities.

Based on an Interdata Model 80, the CCP is actually a turnkey system that provides the 1100 user with both hardware and software teleprocessing support. Chi developed the system after years as a Univac user dating back to the Univac I, the 1107. Currently the firm has an 1108.

A CCP can initially be installed as a CTMC replacement with no changes to the basic Exec 8 operating system. With some modification to the software one CCP can simulate two or more CTMCs, the company said.

When operating as a front end, the CCP handles message protocol and transmission schemes. All conversion of characters is handled in the CCP. When used in the remote concentrator mode, the channel interface is replaced by a modem interface and the front-end functions are handled by a CCP that is remote from the mainframe. Peripherals can be interfaced directly to the remote CCP.

Both asynchronous and synchronous character or bit-oriented interfaces are available with the CCP. The processor is microprogrammed with specialized op-codes to handle the teleprocessing software.

The software can be maintained through an assembler and simulator in the host CPU.

A typical system with 16 terminal ports, interface processor, line handlers and modem cards with support costs "less than $42,000," a spokesman said. Chi is at 1100 Cedar Ave., 44106.

Half of CRT Users Cite Poor Support

By Ronald A. Frank
Of the CW Staff

DELRAN, N.J. – Software and technical support are two problem areas for almost 50% of CRT users.

This is one of the findings of a recent Datapro survey of 268 display users. The survey covered 7,881 installed CRTs with 35.7% from IBM and the remainder from independent suppliers.

The largest number of terminals (61% were operating in local mode) directly connected to the CPU. Remote terminals connected via communications lines numbered 54%. Only 10% of the users said their displays were programmable while 36% were operating clustered configurations and 39% had stand-alone units.

About 15% of the terminals were operating in a "structured" data entry mode similar to a keypunch mode, while 50% used fill-in-the-blanks formatted data entry and 37% said they used a free-form text. Extensive editing was used by about 44% of those surveyed while 39% said they did little or no editing of data.

Users consistently rated the IBM displays ahead of other equipment, but their margin was very small in most categories, according to Datapro. Non-IBM suppliers were rated below IBM in maintenance support although 60% of the users were satisfied.

The lowest users scores of the survey occurred in the software and technical support area where 42% of the IBM users rated their software as fair or poor and the non-IBM users said their support was fair or poor 50% of the time. Datapro attributed this relatively low figure to the "vendor dependency working with a highly formattable device."

More than 2,300 IBM 3270s were represented in the survey with the next largest type being 1,156 GTE IS/7700/7100 terminals. About 470 IBM 2260s were in the sample which covered more than 30 vendors.

The complete study is available for $10 from Datapro at 1805 Underwood Blvd., 08075.

Datran Files Interstate Tariff, Says Reliability Bests DDS

VIENNA, Va. – Datran has filed an interstate tariff with the Federal Communications Commission that is said to be nearly 10 times better in performance levels than other planned private-line services, including AT&T's Digital Dataphone Service.

The tariff covers point-to-point and multipoint service at speeds of 2,400-, 4,800- and 9,600 bit/sec between Houston and St. Louis and went into effect April 4, 1974, the company said.

Datran users will pay on the basis of distance and transmission speed and the carrier will offer a "money-back performance guarantee." That is, if the service fails to provide "99.95 error-free seconds of transmission" on the average, Datran will restore the service and credit the user "for the period of substandard performance." This will apply provided that service problems are not due to a "malfunction of systems, equipment or channels furnished by the subscriber," the company said.

Channel Cost

Monthly rates for service between Datran terminal cities are 75 cent/mile at 2,400- or 4,800 bit/sec; and 90 cent/mile at 9,600 bit/sec. In addition, the user will pay $70/mo for each local distribution channel within metropolitan areas served by the company.

Cities to be served include Dallas, Houston, Kansas City, Oklahoma City, St. Louis and Tulsa and the first interstate user from Texas to St. Louis is expected to be in service by April 30, 1974, the company said.

A typical private-line channel between Houston and St. Louis at 9,600 bit/sec will cost $747.50/mo compared with existing Bell rates of $969/mo, Datran said. In addition, a Datran customer will pay a monthly charge for the Digital Communications Console of $80 at 2,400 bit/sec, $130 at 4,800 bit/sec and $180 at 9,600 bit/sec. A "connecting arrangement" at any speed costs $5/mo. One-time installation charges are $150 at the lower rate and $200 at 4,800- and 9,600 bit/sec.

The performance levels will allow resource sharing between CPUs, Datran said. The carrier plans to add "occasional use switched services" by January 1975.

Idle Terminal Disconnected

SUNNYVALE, Calif. – Datastat, Inc. has a modem accessory to prevent a computer port from being connected to an unsupervised idle terminal after a set period of time.

Clarification

The Radio Amateur Satellite Corp. uses the abbreviation Amsat. It is a nonprofit organization to provide noncommercial satellites for use by radio amateurs. American Satellite Corp. is a separate company which plans to launch a domestic satellite and offer service to data and other users.

The device, called Quiet Interval Disconnect, can be used with any Bell- or IBM-compatible modem, according to Datastat.

The device monitors the transmit and receive data leads in the interface. When no transmission has occurred for the set period, the device disconnects the modem from the phone line and brings the data set ready down for a period not to exceed five seconds, allowing the CPU time to log off a given port.

The device costs $60 with delivery in two weeks from the firm at 246 Sobrante Way, 94086.

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Unit Interfaces BSC Line With Ascii, Asynchronous Devices

NORWALK, Conn. – The Model LCU-11 Line Control Unit has been introduced by Wiltek, Inc. The device permits binary synchronous (BSC) data communication between a CPU and up to 10 printers or five CRTs operating in asynchronous Ascii mode.

The LCU-11 can operate on common-carrier switched networks, or on leased lines in either full-duplex or half-duplex modes. Transmission speeds include 1,200-, 1,800-, 2,000- and 2,400 bit/sec.

The unit permits multipoint control of the communication line using standard line control procedures compatible with IBM 2780 hardware and software. Control of up to five asynchronous Ascii devices is accomplished through an EIA interface.

Each device interfaced via the LCU-11 to the BSC line operates independently of the others. To insure multipoint operation, each CPU port can be assigned a unique address, designating it as a send or receive port. The unit costs $3,500 from Glover Ave., 06852.

Elcom Has Terminal To Authorize Credit

ST. LOUIS – Elcom Industries, Inc. has a credit authorization terminal designed to handle direct entry of authorization requests, unattended servicing of both local and out-of-region requests, and the electronic transfer of funds from the point-of-sale.

Capable of working with a computerized authorization system that has audio response equipment, the terminal is designed for simplicity of operation. The retail clerk inserts the customer's credit card into the terminal, sets the amount of the transaction on the price lever switches, and lifts the handset from the terminal. The clerk then depresses the DIAL button which causes the terminal to automatically dial the authorization center. Upon hearing the connection tone, the clerk depresses the SEND button which causes the terminal to transmit its identification number, the amount of the transaction and the data encoded on the magnetic stripe of the credit card.

If the credit card does not have a magnetic stripe, the clerk can key the required data into the terminal. If the transaction is approved, the authorization computer will generate an audio response. If not approved, the computer will switch the inquiry to an authorization operator. The terminal is $15/mo or $500 from Elcom at 10277 Bach Blvd., 63132.

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Bits & Pieces

Philips Business Systems Gets 512K-Byte Disk Unit

NEW YORK – A two-module cartridge fixed-head disk system, capable of storing up to 512K bytes of data, has been added to the Philips P350 office computer.

The disks have 100 concentric tracks on each side divided into 32 sectors. Each sector has a capacity of 10 words which are normally used to store all the data on one item.

Through the software included, every sector on every track can be addressed individually. The configuration leases for $255/mo from Philips Business Systems, Inc., 100 E. 42nd St., 10017.

Printers Added to Wang 2200s

TEWKSBURY, Mass. – Using two typing heads operating in unison to print a 132-char. line, the Wang Laboratories, Inc. 2261 impact printer can achieve a 330 char./sec (125 line/min) speed for use with the Wang 2200 minicomputer.

Each head travels only half the width of the paper, then prints in reverse on the next line.

Priced at $7,000, the printer features Ascii code, vertical format control and adjustable sprocket feed.

For users with lower budgets, Wang has also added a 2241 thermal printer that uses a 5 by 7 dot matrix, 63 char. font, and has a speed of 30 char./sec. An 80-column unit, the 2241 thermal printer, is priced at $1,400. Wang is at 836 North St., 01876.

Images Digitized With D58

MINNEAPOLIS – The D58 Image Digitizer, from Dicomed Corp., can digitize film transparencies measuring up to 14 inches by 14 inches. Images are projected through a variable magnification optical system into an image dissector tube which scans and samples over four million light intensities in the image field. Each intensity is converted to a 6- or 8-bit computer-compatible data word. The D58 interfaces with most minicomputers and the IBM 2701 line controller and is priced at $54,500 from the firm at 9700 Newton Ave. South, 55431.

Portable Drive Loads PDP-8s

HOUSTON – A portable cassette transport from TC Systems, Inc. reads or writes at 300 char./sec to load or dump 4K of PDP-8 core in less than 30 seconds. A cassette can store over 500K characters, and software interface is included.

The software is delivered in RIM format and replaces the paper tape loader and binary punch programs. Priced at $7795, the unit's program controls tape start and stop to allow selected core areas and memory field to be dumped or loaded. The firm is at 3303 S. Rice, 77027.

Triples Productivity

Colonial Cuts Out Cards

By Vie Farmer
of the cw staff

LOS ANGELES – Colonial Insurance Co. of California has nearly tripled the productivity of its data entry operation since it phased keypunches with a key-to-disk system recently.

The company uses a Computer Machinery Corp. CMC-5 key-to-disk system and an IBM 370/135 to rate and write insurance policies at its headquarters here. This task compares drivers and their

User Casebook

vehicles against established standards to determine overall premium cost, and then policies are printed and issued to customers.

Before switching to the key-to-disk system, about 2,000 policies were input each month, and as Alfred T. Bailey, Colonial's vice-president for systems and procedures, said, "We couldn't keep up with the overtime."

During a recent month using the key-to-disk system, the company issued over 4,000 policies, nearly double the volume of a year earlier. Increases in the number of policies directly influence the amount of data to be processed since 10% of the policies receive change endorsements each month.

Discards

This work load runs over 12,000 source documents per month and by using the key-to-disk system, Bailey eliminated the use of 20,000 to 24,000 punched cards per month.

Before switching to key-to-disk, the Colonial data entry section's 11 employees worked two shifts and used two IBM 129s, two 059s and three 029 punches. "We simply couldn't keep up with the company's increased business and usually were behind schedule, even with an average of 40 hours per week of overtime," Bailey recalled.

"We wanted to drop the midnight shift, get more efficiency out of our equipment, and leave room for continued expansion," he said. With the key-to-disk switch, Bailey went to one shift, promoted one keypunch operator to supervisor and transferred another to clerical duties; two others left the company. The seven remaining operators now handle all of the data preperation during a one-day shift without overtime.

The minicomputer in the CMC-5 is programmed to rearrange formats to comply with Colonial's input forms and contribute to increased productivity.

When Bailey evaluated the IBM 3740 key-to-diskette system, he decided the diskettes themselves were unwieldy and difficult to keep track of, even using the different-colored labels, and also at that time there was no internal clock that would make operator statistics maintenance practical.

The key-to-disk system maintains records that tell Colonial how long it takes to complete each batch of data keyed and reports derived from these records help give practical time to complete estimates for other batches. "I can also chart each operator's progress and objectively judge their performance," Bailey concluded.

Mini System Automates Hospital

PALO ALTO, Calif. – Hospitals seeking to install a real-time on-line computerized medical information system can get a dedicated mini system from Spectra Medical Systems, Inc. The system, based around a Data General Nova 840 with up to 128K (word) memory, uses a Century Data 2314-type disk drive, Alpha Data 2M-byte fixed-head disk, Wangco tape drive, 50 kbit/sec Data General communications interface and a Computer Communications, Inc. multiplexer with a 4-color CRT, light pen, keyboard and Versatec electrostatic 600 line/min printer at each station.

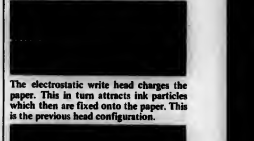
The system handles admit/discharge/transfer; medical order entry; medication scheduling; medication charting; permanent chart document preparation; nurse scheduling; current census; patient drug profile; staff requirements report; utilization review report; charge capture; and contains an extensive drug interaction library.

The system is accessed at a dats station through keyboard entry of a six-character password and only a valid password gains access to the system. Users are limited to appropriate information.

Orders automatically generate printed confirmation at the station where entered and transmit requisitions to all appropriate ancillary services. This information is entered into scheduled reports (medication schedules, bed availability, nurse staffing, utilization, patient profile, etc.) in real-time and prints them automatically or at the request of authorized users.

Patient information is electronically stored, sorted and reformetted in the system's memory. The complete capture of this information can be used for automatic preparation of patient charges.

The system costs range from $1.30 to $3.95 per patient day for a typical 300-bed hospital or up to $30,000/mo for a complete system. The firm is at 1121 San Antonio Road, 94303.



The electrostatic write head charges the paper. This in turn attracts ink particles which then are fixed onto the paper. This is the previous head configuration.

The New Writing Head Configuration

Varian Claims Blacker Type Printer Output

IRVINE, Calif. – By reconfiguring the writing head styli in two staggered rows, instead of the usual single row, and by increasing styli diameters 60%, Varian Data Machines (VDM) claims it has improved its electroststic printer/plotter's image contrast by 250% over previous models.

The Statos 33 family of printer/plotters are available in 8-1/2-, 11-, 15- and 22-inch widths.

The 22-inch models are specially targeted for computer-controlled weather mapping, seismic plotting and computer-aided drawing applications including "D" size drawings. They print 211 columns across 21.12 inches of roll paper, operate in the 550 line/min range and are priced at $10,850 without controller.

Other models in the family use both fanfold and roll paper, and operate at speeds up to 700 line/min. All models are available for on-line and off-line systems.

For on-line applications, controllers and interfaces are available to connect Statos units to most minicomputers. The Dataplot 11 software consists of Fortran and assembly language subroutines which are callable from a Fortran program.

The 8-1/2-inch printer/plotter costs $6,900 without controller.

Off-line printer/plotter systems include a Statos unit plus a 7-track or 9-track magnetic tape transport. Two types of software packages are offered for these systems – a Fortran-based general plotting program (GPR) and an assembly language-based graphics program (JPR) – both of which are used on larger computers such as IBM 360/370s to produce magnetic tapes. The GPR software is employed for building original plot programs, while the JPR package converts existing pen plotter programs to the proper format for output to the statos printer/plotter. Varian is at 2722 Michelson Drive, 92664.

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PDPs Get Tape Reader

Mini, Controller Rate a 'Letter'

LYNWOOD, Calif. – A controller unit designed to link a mini to an IBM 1403 printer has made possible the use of the minicomputer for high-volume computer letter printing.

Forms Engineering Co., a seven-year-old firm here specializing in computer letter printing for major national organizations, wanted to retain the advantages of its IBM 1403 printer without the expense of the IBM 360/20 data processing system, which was previously used to drive the system.

Spur Products Corp. of Santa Monica, Calif., developed a unit that interfaces a General Automation SPC-16 minicomputer with the IBM 1403 printer. Forms Engineering now has the flexibility, dependability and printing quality of the 1403 system but with a system that costs much less, is easier to operate and occupies much less space than before, according to Ron Thomas, Forms Engineering general manager.

Forms Engineering's 360/20 was leased for about $3,500/mo. The system that replaced it was purchased for about $36,000. In both cases the 1403 printer was leased.

At Forms Engineering, customized information is imprinted in letters previously printed as much as possible on a standard printing press. The computer-generated data ranges from merely the name, address and salutation at the top of the letter, to individualized material, such as the addressee's name in the body of the letter. This requires automatic respacing of the line and, in some cases, the entire paragraph containing the fresh material.

Names, addresses and other data to be "filled in" are stored on magnetic tapes supplied by the firm's customers. Instructions necessary to personalize the letter are input to the system through punched tape. A computer subprogram in the controller enables the non-technical Forms Engineering personnel to modify the printing format through a standard teletypewriter keyboard.

Print data stored in the computer's core memory, after being taken from the magnetic tape, is supplied on demand to the controller, which in turn generates control signals to the 1403 printer.

The controller, which is programmed to read one line of type being supplied by the core memory while the previous line is being imprinted, actually enables the printer to operate at faster than normal speed, Thomas said. The Forms Engineering system prints 600 line/min from its standard font of 96 characters.

The 4K memory in the General Automation minicomputer gives the system the capacity to imprint 3-1/2 million personalized letters per month on two shifts. If desired, the system could be expanded by the addition of a second magnetic tape drive, controller and 4K memory. The SPC-16 minicomputer has the capacity for a total of 64K memory.

The Forms Engineering system became the prototype of the recently introduced Spur Products off-line printing system that permits off-line use of the IBM printer.

Unit Optically Loads Minis

WESTWOOD, Mass. – The OTR-120, from Computer Identics Corp., optically reads paper tape at 120 char./sec into a DEC PDP-8 or -11. Options include a field carrying case, paper tape bin and rack-mounting adaptor. The reader is supplied with its own printed circuit interface which plugs directly into the processor.

The PDP-8E reader is priced at $995, the PDP-11 unit at $1,155 from the firm at 31 Dartmouth St., 02090.

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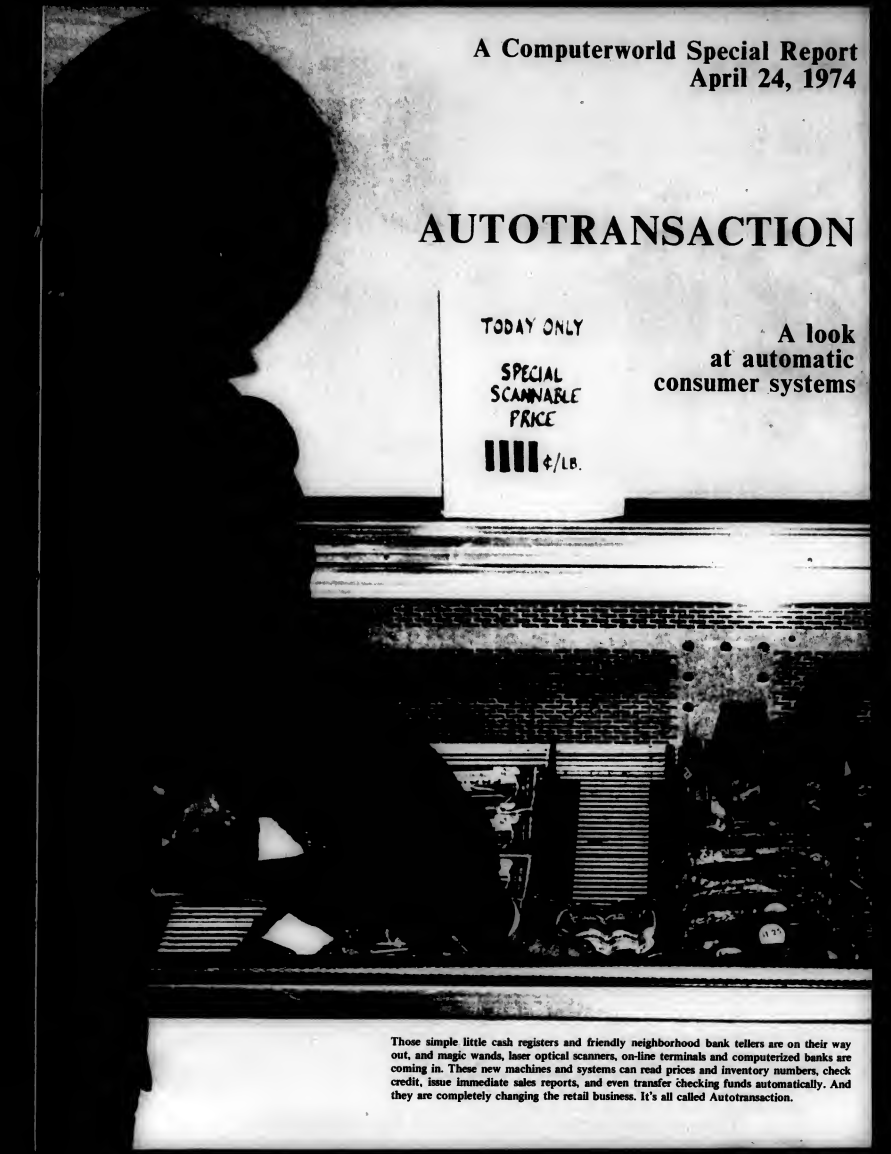
A Computerworld Special Report
April 24, 1974

AUTOTRANSACTION

A look at automatic consumer systems



Those simple little cash registers and friendly neighborhood bank tellers are on their way out, and magic wands, laser optical scanners, on-line terminals and computerized banks are coming in. These new machines and systems can read prices and inventory numbers, check credit, issue immediate sales reports, and even transfer checking funds automatically. And they are completely changing the retail business. It's all called Autotransaction.

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To Whose Benefit—Consumer or Corporation?

Terminal-Based Systems Entering Every Area of Life

By Ronald A. Frank
Of the CW Staff

It was inevitable that the terminal points of DP systems would wend their way closer and closer to the consuming public. In banks, supermarkets, retail stores, the home, restaurants and other environments providing services to the average consumer, the terminal-based automated system is beginning to encroach.

The grocery chains and department stores, and credit validation systems and all the rest are certainly entitled to optimizing their operations with the aid of on-line systems. Just as the average business began to rely on a DP center to do its accounting and inventory control and payroll during the Sixties, the consumer-oriented areas are now beginning to install systems based on automated transactions or "autotransaction."

And like the worker who began to get computer-printed checks years ago, the consumer has taken a generally disinterested view of the emergence of autotransaction systems. It was certainly not surprising that the benefits of terminal entry began coming closer to the actual transaction.

What has been surprising is the public hard sell that has invariably accompanied the introduction of these systems. In almost every case, "wizards, accurate scanners, magic wands and universal product codes have been touted and advertised for their great benefits to the consumer. The supermarket shopper has been told that a $7,000 terminal will not only display a price at the inhuman rate of one per second but it will also shave an unheard-of 10 seconds from that interminable wait at the checkout counter.

Similarly, the credit customer has been told that the second plastic card sent home by the bank and called a cash or debit card is really for his own good. It will help him balance his bank account, which has now gone on-line, with minimum effort.

ANALYSIS

In many cases the vendors of autotransaction systems, along with the firms that are installing them, have gone out of their way to pronounce the consumer benefits. Several articles in this special report were written by autotransaction experts working for the major suppliers. Few of the benefits carefully outlined in these articles will cause the consumer to demand implementation of these new systems.

One of the most controversial areas covered by autotransaction is that of the Electronic Funds Transfer Systems (EFTS). While the public is certainly not clamoring for EFTS, these systems will succeed when they provide conveniences to the customer that were not previously available.

Among the areas where EFTS will offer new conveniences are check-cashing in the supermarket, automatic teller services on a 24-hour basis and similar offerings that are not now provided to the banking public. Quoth Martin Ernst, vice-president of Arthur D. Little.

"One of the real problems is the 'less-check, less-cash society' is not going to grow very fast," Ernst said. The main reason is that the average consumer does not find much to his advantage and many stores are similarly unimpressed, he added. ADL is currently studying this area and Ernst stressed that these views are still preliminary pending further investigation.

The process of making cash more widely available through computerized systems does offer a convenience to consumers and may also offer cost reductions to stores that otherwise have to handle checks, Ernst said. A service of this type was recently instituted in the Midwest where a supermarket began providing an automatic check-cashing/account depositing service in conjunction with a local savings and loan institution.

The supermarket is a place where there is normally a cash transaction rather than a credit transaction. And the profit margin is so small that losses from credit cannot be tolerated, Ernst said.

"But a payment and collection arm of the bank can be moved up close to the cash register," he explained. This is a real convenience to the customer because he does not have to carry money around, and he can access an interest-bearing account directly through a card, Ernst said.

Obviously all autotransaction systems cannot greatly enhance the services that are now available to the consumer. They may make an existing operation such as a supermarket checkout more efficient, but they will not drastically alter the way the consumer does business.

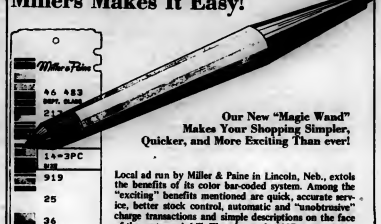
Nothing Wrong With Honesty

Why then the hard sell? Why not simply tell the truth? These systems are being implemented to make the firm serving the consumer more efficient. If, in the course of such implementation, service is improved or perhaps prices lowered, fine. It is no crime for a businessman to optimize his operation. This was the primary motivation of management when the first DP centers began to operate.

There are some areas where the rights and options of the consumer could be restricted by autotransaction systems. One example is EFTS and in such instances, the consumer should get full disclosure and cooperation to safeguard his interests.

While the consumer is not clamoring for autotransaction systems, neither has he actively resisted them. In one specific test of an on-line credit authorization system in Ohio, the incidence of consumer charge purchases neither increased or decreased.

If the vendors and users of autotransaction systems would simply tell the consumer the truth about these systems, it would go a long way toward speeding their acceptance by the public.



Our New "Magic Wand" Makes Your Shopping Simpler, Quicker, and More Exciting Than ever!

Local ad run by Miller & Paine in Lincoln, Neb., extols the benefits of its color bar-coded system. Among the "exciting" benefits mentioned are quick, accurate service, better stock control, automatic and "one-brush" charge transactions and simple descriptions on the face of the customer's bill. The ad says the NCR system is the first to be installed anywhere and adds that it is one more way in which the store seeks to serve the public better.

Stakes High in POS Game, Study Finds

Point-of-sale (POS) systems are really just beginning to have a significant effect on the retailing industry. With an ultimate replacement market of over three million cash registers, and a realistic replacement market of over half a million cash registers by 1980, the stakes are obviously high.

In addition, the advent of credit card authorization and credit purchase terminals and automatic merchandise tag readers further strengthens the emphasis being placed on this segment of the data processing industry.

While the cash register market has had only two major suppliers in recent years (NCR—about 80% of the market and Sweda with 15%), the companies producing the new integrated POS systems number at least a dozen. Moreover, the total number of POS equipment makers is approximately 40, including manufacturers of electronic cash registers, merchandise tag readers and credit card authorization terminals.

These companies, besides NCR and Sweda, include a major retailer and diversified manufacturing company (Singer), numerous electronics manufacturers (Bunker Ramo, TRW, National Semiconductor, AMF, Motorola, MSI, General Instrument UniTote) and several computer manufacturers (IBM, Univac, Data General and Digital Computer Controls).

The recent departure of a major competitor, Pitney Bowes-Alpex, points up the fact that the required finances can go well beyond the estimated limits. The effects of the demise of Pitney Bowes-Alpex have yet to be fully felt, but the situation will definitely make retailers more cautious in manufacturer selection and will frequently lead to the selection of two manufacturers rather than one as an added safeguard. This trend, in turn, will lead retailers to insist on complete compatibility between systems from different suppliers.

While the manufacturers of general retail POS systems are now reaping the benefits of several years of testing and demonstrating their systems, the food store POS manufacturers have yet to achieve any significant market penetration. Thus, it is noteworthy that the number of companies producing integrated POS systems for the general retail market appears to be holding steady at five while the number of supermarket POS manufacturers continues to grow.

The retail industry, which by its equipment choices will ultimately determine the surviving companies, has taken a rather aggressive attitude in determining its own destiny. General retail merchandising, through the National Retail Merchants Association (NRMA), has not only kept its members constantly aware of the POS state of the art but has also assisted manufacturers in meeting industry demands.

Likewise, the food industry, through the Supermarket Institute and UPC Council, has arrived at a standard item description process for automatic reading. One result of this activity is a faster-growing market than had previously been anticipated.

While the use of POS systems is following a typical evolutionary pattern, the active involvement of retailers and their industry groups has been the key factor in the success of these systems to date.

The cash register is getting a new life through the development of electronic versions that not only perform automatic tax and total calculations, but also permit the retailer to capture essential inventory data. These registers, when combined with a credit card authorization capability, can provide the small retailer with a new dimension in conducting his business.

The supermarket systems are in the earlier stages of their growth pattern. In 1973, the integrated supermarket systems were used in test situations or as early keyboard-entry versions of the eventual

(Continued on Page S/4)

This article is an excerpt from a Datapro report on point-of-sale equipment. The complete report is available for $150 from Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

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This special report was prepared by Ronald A. Frank, *Computerworld's* Associate Editor, Technical News.

Just What Is This Thing Called Autotransaction?

By James Peacock
Special to Computerworld

Autotransaction spans many segments of the computer industry. It is derived from the words automatic transaction and it refers to products and services that meet four criteria:

- They are computer-related.
- They were designed with a particular business sector and/or specific application in mind.
- They involve transactions to and from a data base.
- They are designed for more than one user.

What are these products and services? They are a whole new breed of terminals – information appliances – which include point-of-sale (POS) terminals, autotellers and money machines for banks, ticketing, credit verification and stock quotation terminals.

In addition, there are turnkey systems – usually minicomputer-based – for applications such as credit authorization, hospitals, hotels and parimutuel betting. There is software sold separately (rather than as part of equipment packages), particularly for banks at the present time.

In addition, there are services such as insurance claims processing, brokerage recordkeeping, stock quotation, credit verification, distribution accounting and tax return preparation. Some of these still operate in batch mode; others are already on-line.

Who uses autotransaction products and services? The leader is banking, followed closely by the general merchandise retail trade. Other major users are security and commodity brokers, insurance carriers and credit agencies other than banks.

Furthermore, wholesalers, medical/health services, amusement/recreation providers and the printing and publishing industry make significant use of autotransaction products and services today.

Revenues from these autotransaction products and services amounted to about $1.3 billion for U.S. companies last year. Of that, services accounted for almost two thirds of the total, information appliances one fifth or about $300 million.

It is estimated that worldwide autotransaction revenues for U.S.-based companies will reach some $4.4 billion by 1976, with the information appliance or terminal sector growing about twice as fast as the service portion. Each should account for about $1.75 billion in revenues that year.

Today the thrust of autotransaction is focused on banking and retailing, on the entire payments mechanism. Retailers are moving ahead rapidly in point-of-sale (POS) and banks are pursuing electronic funds transfer systems (EFTS). Most recently, at least one bank card operation has proposed a network that will tie these together, along with money card operations and possibly offering POS backup services to smaller retailers.

Perhaps a little further in the future, CATV is expected to play a major role in autotransaction systems. In addition to selective programming, this two-way transmission mechanism offers such activities as shopping at home and data base browsing.

James Peacock is editor of Autotransaction Industry Report, published by International Data Corp., market research firm. He is credited with having originated the term autotransaction.

Survey Sees High Stakes, Bright Future for POS

• Retailers Already Reaping Benefits
• New Life for Supermarket Registers
• Improved Interface Capabilities Coming

(Continued from Page S/3)

UPC scanner systems.

The price per terminal, which is $4,000 to $5,000 at present, is expected to increase to approximately $10,000 per terminal with the implementation of the UPC optical scanners, extensive item description storage capabilities (e.g., for 20,000 items) and data communications capabilities.

The higher price per terminal, compared with that of the general retail merchandising systems, is largely due to the smaller size of the supermarket systems (e.g., about 10 terminals versus 40 to 60 terminals). Therefore, the controller costs must be apportioned over fewer stations. Furthermore, the trend toward duplexed controllers and disk files represents an additional expense.

The makers of credit authorization equipment have scored significant sales as many merchants have decided to augment their present cash register systems by adding credit authorization terminals before evolving into the integrated systems. The 80 million U.S. credit card holders, combined with over $300 million in credit losses annually, produced a ready situation for the implementation of credit card terminals.

While this field has been dominated by TRW and IBM, there are a significant number of smaller vendors. The types of terminals have separated into two varieties. The predominant number are simple keyboard-entry devices or credit card readers that are only used to check a customer's credit standing as indicated by files in an in-store or centrally located computer system.

A newer variety (e.g., Addressograph Multigraph's Amcat) performs a credit sales function as well as credit authorization. This unit employs an imprinter for the sales slip.

While the cost of the first type averages less than $1,000 per terminal, the latter type costs $1,000 to $1,500 per terminal.

Another important facet of the credit authorization market is the development of nationwide credit systems by American Express, BankAmericard and Interbank (Master Charge). Obviously, the newer terminals must have the capability to interface with all credit card company systems. The prime users have been department stores, specialty stores, service stations, restaurants and transportation facilities. Also, numerous banks have experimented with electronic funds transfer systems in their communities, using the credit terminals as the principal hardware elements.

What Lies Ahead?

While the general retail merchandising field is in the midst of large POS purchases, the food industry is just starting to consider this new technology and is roughly three years behind. Also, while the general retail merchandising terminals cost approximately $4,000 each, the food POS terminals will average close to $10,000 each because of the additional cost of the UPC optical scanner and transport.

The general retail merchandising field has undeniably been the driving force toward the important recent developments in POS systems. Through its voice, NRMA, it has cultivated an unusually close relationship and direct communication between the POS manufacturers and the users.

Improvements in system design will include the ability of the terminals to interface with all national credit card systems, on-line check authorization to a bank, electronic funds transfer, data base inquiry and POS applications software. Future POS systems will have the capability of interfacing with all the major computer systems.

A standard retail merchandising tag reading code has yet to be selected, with optical bar code, magnetic stripe and optical character readers still competing. While OCR merchandise tags appear to be the most probable choice, the capability to read the magnetic stripes on standard credit cards must also be included in the terminals.

In particular, the terminals will permit purchases to be made by bank fund transfers rather than by cash. The implementation of such systems will have a direct effect on reducing robberies, resulting in wide industry acceptance.

With the composition of large retail stores typically changing from a central downtown store to numerous suburban stores, data communications becomes a necessity and the POS device is not just a means of data capture but an on-line inquiry terminal as well.

Food store merchants are just beginning the use of integrated POS systems. These integrated systems, unlike the general retail systems, heavily stress the economies achievable at the checkout counter. Automatic item tag reading, however, is a requirement for complete success in this area.

No requirement for credit authorization appears likely for some time to come, yet the credit checking capabilities inherent in some of the new systems will entice many supermarkets to accept credit cards within the next few years.

The evolving supermarket systems are based upon automatic reading of the standard UPC symbols. This requires combined merchandise transport/scanners with register/terminals under control of a minicomputer with extensive price look-up capability.

Most manufacturers will not have UPC scanners ready for delivery until late 1976, and most supermarkets will not be prepared to take advantage of such scanners until 1975 – even assuming that there is no adverse consumer reaction.

The fast food industry, although not as extensive a market as the previously mentioned POS areas, does represent nearly 35,000 cash registers at present. It also represents the only important POS area where hand data entry can be a justifiable alternative to keyboard entry, due to the limited food menus and selection variations.

At present, the tendency is toward the use of keyboard entry based on its similarity to cash registers. In fact, most electronic registers for the fast food industry (e.g., AMF, Digital Computer Controls, Trant) utilize this approach.

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Department Stores to Specialty Shops

Terminals Play Diverse Roles at Mall

ATLANTA – A tour through Atlanta's Cumberland Mall shopping center reveals extensive use of point-of-sale (POS) systems – adapted to the specific needs of both large stores and smaller specialty shops.

The new generation of electronic systems, as modern as the "shopping-resort" atmosphere of the Cumberland Mall, capture data from POS transactions for automatic preparation of accounting and merchandising reports. They are now operating in all four of the mall's main stores in the 101-store center. In addition, numerous specialty shops are using or have ordered POS systems.

Some of the stores use terminals on-line to central processing units located in stores, while others save transaction data for daily polling by a remote processor.

In either mode, the basic POS functions are performed: extending prices, calculating tax, discounts and change, displaying amounts and printing receipts. In addition, computed reports of a day's business are available for management use the following morning without the error-prone and time-consuming chore of re-entering data. Furthermore, the systems provide stores the opportunity to check and authorize credit on a real-time basis.

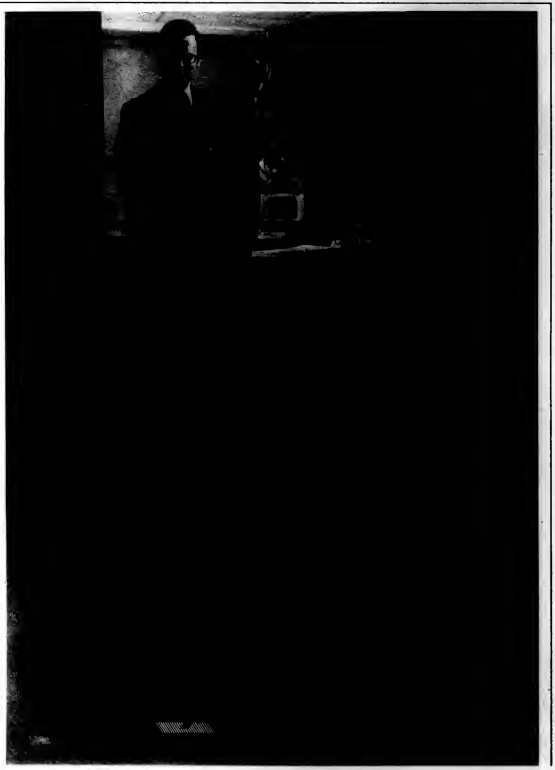
At Cumberland Mall, J.C. Penney, Sears, Joseph R. Harris, Hahn's Shoes, Casual Corner, J. Riggings, The Singer Sewing Center and Citizen Jewelry use Singer MDTS systems. Other Cumberland stores scheduled to install Singer systems are Zales Jewelry, Chandler's Shoes, 5-7-9 Shops, Florsheim Shoes, Lane Bryant and Kinney Shoes.

NCR 280 systems are in use at Davison's and the Craft Showcase. American Regitel is operating at Rich's department store.

'Effective Tool'

R.H. Martin, operations manager at J.C. Penney, believes "retailers have been slow to recognize POS as the most effective working tool available to the merchant."

J.C. Penney's Cumberland Mall store is equipped with 51 Singer Model 925 terminals on-line to a System Ten computer. According to Martin, this information system allows Penney's employees to more effectively apply their skills.



R.H. Martin, operations manager at J.C. Penney's Cumberland Mall store, observes sales audit report printed from data automatically captured by point-of-sale terminals located throughout the store.

Sales personnel no longer must be trained in all intricacies of store paper flow and procedures and spend more time doing what they know and like best – selling. Cashiers, specialists in the store's POS and paper flow procedures, are now free for reassignment among departments as required by shifts in shopping activity.

"Furthermore," stated Martin, "errors from manually calculating tax are non-existent."

J.C. Penney's Cumberland Mall configuration includes a System Ten with a 40K CPU, a Model 40 10K disk drive and a Model 70 input/output workstation. Terminals are clustered around central wrap stations and individually located in other sales-service areas: garden shop, jewelry, cosmetics, cafeteria, gift wrap, etc.

The System Ten prepares nightly reports during a three-hour unattended run. Audit reports, including terminal balances, errors, corrections, week-to-date net sales and subdivision reports (summaries for regional offices) are available the next morning.

Soon merchandising management reports will be placed on-line. Terminal-captured data at J.C. Penney stores will be polled centrally by a regional computer. Among the reports generated will be: inventory validation, item performance, sales and markdown, price breaks, on-hand versus model stock, problem merchandise, and sales and inventory analysis. Perpetual inventory status will be available by lot, color, level and SKU (stock keeping unit number). Reference options will be visual display terminals or hard copy, as required.

"Our system will help us achieve our goal of a 95% in-stock position," Martin said. "With the merchandise data our system will provide, we'll be in a much better position to track inventory, place reorders faster and provide the merchandise customers want when they want it. This can only mean a larger sales volume and a more profitable operation."

Small Stores, Too

POS systems are equally advantageous to smaller specialty chains. At Cumberland Mall, Joseph R. Harris, women's fashion shops (a division of Garfinckel, Brooks Brothers, Miller and Rhoads, Inc.), and 21 other branch stores use Singer Model 902 terminals on-line to the company's Rockville, Md., headquarters.

"Our stores previously used mechanical cash registers," the Harris store manager said, "and most reports were therefore created manually. Our merchandise re-

(Continued on Page S/7)

Mall Systems 'Effective Tool' for All Size Merchants

(Continued from Page S/6)

placement is much faster now. As a result, our turns have increased as has our customer service."

Each Harris store terminal is equipped with a Singer Model 705 print punch tag reader which automatically records pertinent data such as vendor, style, classification, size, department, color and price from Kimball marking tags.

The stores also use Singer ISF (Individual Store and Forward) modules, a data collector which operates unattended and records transaction data on magnetic tape. Daily, after a store closes, each ISF is polled by the central computer via telephone lines.

Resulting daily merchandise reports provide Harris buyers with detailed analysis of what is selling at each store. Hot items are transferred among stores easily without time-consuming interstore paperwork.

Timely and accurate issuance of salesmen's commission checks are enhanced through POS systems. Hahn's, a division of U.S. Shoe, uses Model 902 terminals in most of its stores, including its Cumberland Mall outlet.

In addition to sales data, salesmen identification numbers are captured on each transaction. Hahn's System Ten, located at its Landover, Md., headquarter's polls ISF modules at branch stores nightly. Magnetic tape output from the System Ten is input into an IBM 360/22 for payroll and inventory control processing.

Hahn's merchandise reports are now available in three to five days instead of 10 days. Reorder points are automatically signaled, as are opportunities for interstore transfers.

Fewer Personnel Needed

Prior to installing its POS system, Hahn's manually input merchandising data from sales checks with key-to-tape machines. With automatic data entry, errors have decreased considerably and more complete and timely reports are generated without the former use of part-time evening data preparation personnel and with half the full-time data processing personnel.

Joyce Bedingfeld, manager of the Cumberland Mall Casual Corner, a branch of a women's sportswear chain and also a division of U.S. Shoe, cited further evidence as to the efficacy of POS terminals in promoting sales.

"With our prior manual system," explained Bedingfeld, "I spent four hours every Saturday morning preparing a weekly inventory report. Now I devote that time to my real job of managing and promoting sales.

"POS has also improved our customer service by speeding checkout. You can imagine the long lines of impatient customers on Saturdays when we wrote as many as 200 cash sales manually," she noted.

Casual Corner also uses an automatic tag reader attached to each of its Model 902 terminals. Previously store sales audit personnel spent at least an hour a day manually reviewing sales stubs to recap sales by class, vendor, style, size, color and price.

Similar terminals are used at another division of U.S. Shoe – J. Riggings, a contemporary men's fashion store also represented at the Cumberland Mall.

"We've found the system particularly helpful in eliminating errors," reported Tom Mobley, assistant district manager for the 10-store Southern chain. "Taxes are computed automatically, quantity extensions save time and, of course, the resulting daily buyer reports are invaluable."

POS terminals in Casual Corner's new Atlanta Cumberland Mall store provide fast and efficient checkout.

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But Public Acceptance Requires Greater Understanding

Basic EFTS Services Can Provide Many Side Benefits

By Frank Curran
Special to Computerworld

Before the consumer allows his cash and checks to be exchanged for electronic impulses controlled by a computer, he will have to understand the implications and benefits of Electronic Funds Transfer Systems (EFTS).

Some of the EFTS services are not really futuristic and may even seem commonplace to those who are already users.

The first of the consumer-oriented services is direct payroll deposit (DPD). This in effect means employers deposit employees' paychecks into their bank accounts rather than physically distributing checks or cash to each individual. In reality, the payroll data is given to the employer's bank which effects transfer to the employee bank account, which is probably in the same bank as the employer's.

This service is not really new, but only a small percentage of the population uses it due in part to the restrictions on choice of bank for the employee. The new twist is the arrival of automated clearing houses (ACH) which expands considerably the number of banks which can receive pay deposits from the employer's bank. The employee now can be flexible in the choice of his bank, which may well be different from his employer's.

Basically the advantages of DPD to the consumer are:

- Eliminates time and inconvenience involved in check depositing.
- Provides consistent availability of funds. The pay is deposited even though the employee may be on vacation, a business trip or ill.
- Eliminates the danger of lost or stolen paychecks.
- Enhances the ability to obtain bank credit because of a more continuous and permanent bank relationship.

Many Sideroads

The real importance of DPD, of course, is that it is the key to so many other services. It captures the employee's funds and can serve as the deposit source for various bill payment and other services.

The general service category of "bill payment" services is directed toward those paymcnts which are made periodically now from home, probably by writing checks. Generally, these include variations of preauthorized or prearranged payments.

Prearranged payments work like this: The consumer authorizes the billing company to directly bill his bank account, and he also authorizes the bank on a continuing basis to pay the bill. This type of payment is most applicable to predictable amounts on a fixed schedule, e.g., insurance premiums or mortgage payments.

Advantages of this service to the consumer are mainly twofold: convenience in not having to write a check to pay a bill and elimination of postage expense and late or interest charges.

The bill-check-type service is more acceptable for variable amount or one-time charges. In this approach, the billing company sends a combination bill and check to the consumer, who signs the document to authorize payment from his account for any part of the bill when he chooses. The consumer then returns the bill, now a check, to the billing company which in turn enters it into the banking system for account debiting and crediting.

Perhaps the most exciting, from a technological standpoint, of these bill payment services was the recent In-Touch experiment in Seattle. Consumers were invited to use their Touch-Tone telephones to arrange funds transfers directly from their bank accounts. This arrangement also provided for remote computer personal budgeting services. The experiment had a short life primarily due to limited availability of Touch-Tone phones in the area, costs and complexity of using the system.

Another service, the automated teller, provides a good deal of convenience to the consumer. This device is also called "unattended teller," "cash machine," "convenience teller," and many other names. This is a terminal that permits a consumer with a special plastic card – and a memorized security number – to receive packaged cash which can be charged to his check or savings account, even if it overdraws the account. In this case, the bank customer must have already arranged for overdraft or line-of-credit checking – a form of preauthorized loan.

The consumer can also make deposits and transfer funds between accounts, for example effect a mortgage payment from a checking account.

The advantages to the consumer are apparent. He can conduct bank business without waiting on teller lines and has the convenience of access to cash on a 24-hour, seven-day-a-week basis.

Sample Customer

There has been much talk about point-of-sale (POS) systems. This type of service can take many forms but one of the most common would probably look like the following.

The consumer carries a plastic card which is issued by a bank. This is not a "credit card" as we know it today – a card used for deferred payment plans. Rather it might be called a "debit card" or a "cash card." The key difference is that it would probably be used for check cashing guaranty and making purchases on a cash basis.

The card would be inserted into a reader which could access the consumers bank account balance and determine if sufficient funds were available to cover the check or make the purchase. The necessary funds are then deducted from the balance.

The advantages of this approach to the consumer are increased knowledge and control of his funds resulting in eliminating bounced checks, reduced possibility of overextending himself financially through deferred payments, probable availability of a cash discount – currently 2% – for using this system, the convenience of another service option, and less time spent waiting in line because the transaction process should be faster.

There are, of course, other variations of these services and other services which have not been described here. Essentially, all of these services are directed at both reduced use of cash and checks and improved financial services designed to attract consumers through convenience and ease of use.

There are some strong forces working against the development of the EFTS

(Continued on Page S/12)

'First You Gotta Promise My Husband Will Never Know!'

Potential POS User Has Range of Technical Choices

By Richard P. Shaffer
Special to Computerworld

Those who have been in retailing for any length of time must recognize that we are living through what may prove to be the most important era in the history of the industry. The introduction of electronic point-of-sale (POS) is to the retail industry what Armstrong's landing on the moon was to the world in general. To quote one prominent retail executive, POS is "the retailer's dream come true."

An automated POS system is essentially a cash register-like terminal which operates either on-line to a computer or temporarily stores data for later processing.

These terminals have varying capabilities. Some will automatically "read" a customer's credit card. Some will read price and merchandise tags.

Most manufacturers also offer optional hand scanning devices which "read" magnetically encoded or bar-coded price tags. This eliminates the need to keypunch the transaction information into a terminal. It not only speeds up checkout lines, but also requires the use of a special printer to make the tags.

The technology alone would fluster the most scientifically minded executives. Then tack on the trade-offs involved in the different types of systems – on-line or off-line, terminals with logic vs. terminals without, magnetic scanning vs. bar-code scanning – and the decision to go with terminals becomes complicated indeed.

Communications Link

In order to better understand the implications of this total system, let us look at the communication link which exists between the terminal and the ultimate computer which performs the major portion of the processing of the data which is collected at the point of sale.

Obviously, there is a considerable amount of technology involved in communicating between the terminal and the computer. In terms of systems design, however, it is important to note that a vital link in this system is a minicomputer.

Ultimately, the decision concerning the systems design associated with POS devices is highly dependent upon techniques and technology associated with this minicomputer. Is it truly interactive or just a multiplexer?

Once a store has recognized the alternatives and advantages of POS equipment, then there is still the technical consideration associated with the integration of POS equipment into the total system environment. Here we may break this equipment into two categories: off-line and on-line.

Within each of these headings, the equipment is divided into identifiable subgroups. First, within off-line, the sub-

(Continued on Page S/12)

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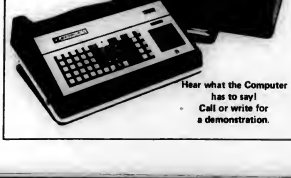

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Need for More Data Prime Motive for Potential User

(Continued from Page S/10)

groups are equipment which produces transmittable output such as magnetic tape, and equipment which produces non-transmittable output such as journal tape.

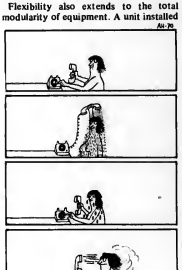
On-line equipment can be described again by two subdivisions. First, there is the method of connecting the terminal to the system. This can be done either by direct cable or using telephone lines.

The second subgroup involves the type of computer to be used. Here we find either a general-purpose computer or a special-purpose (mini) computer. And finally, these connections and computers may be used independently or in any one of a number of combinations.

Certainly, rapid advances in technology have made electronic POS feasible. But this rate of technological change is a two-edged sword. If a system is selected today will it be obsolete next year? Currently, the most significant question in POS technology is optical encoding vs. magnetic encoding. Retailers are afraid to make a choice which may lock them into a system which may become obsolete.

In reality, these same technical achievements can solve this dilemma. Many POS suppliers have designed their equipment to be flexible enough to adapt to either optical or magnetic input. Thus, one important criteria for selecting a manufacturer should be his ability to accommodate changing technology

Flexibility also extends to the total modularity of equipment. A unit installed today which involves the indexing or keying of merchandise information should be adaptable to a wand reader or other hand-held device if so desired at a later date. The retailer should determine at the outset what the cost for making such adjustments to the equipment configuration will be.



Information Need Vital

The most important impetus for installing POS equipment is information, both merchandise and credit. Of secondary importance is the requirement for accurate capture of increased amounts of data.

The third requirement is for speedier checkout in order to solve the problem of customers queuing up at the registers and avoid the loss of good credit customers who become annoyed at the length of time it takes to check credit.

These last three items taken together – that is, the need for more information, the need for accuracy and the need for speed – underscore the problem which must be solved at the point of sale. That is, accuracy and speed appear to be in contradiction to the need to process more data.

Speed alone does not provide sufficient cost justification for installing these systems. Such a justification can be found, however, in the impact of increased speed, accuracy and quantity of data on the total merchandise system. This is reflected in the type of exception reports that the system will provide for the store. The difficulty here is to place a dollar value on these expanded reporting capabilities. It is up to each individual retailer to determine how much such improved information is worth to him.

Another key advantage of POS systems is in the area of financial control. These systems have the ability to tie together, through their data collection techniques, both unit and dollar information. Prior to these systems, information for unit control traveled one data path while information for dollar control traveled another – and never the twain did meet (or balance).

Simultaneous capture of both unit and dollar information improves control over operations by allowing the retailer to pinpoint inventory position and make accurate adjustments. With these systems, the retailer knows that his reported "shortage" is really a shortage, and not simply an error introduced somewhere up the information stream.

The credit explosion has added pressures of its own on retailers to improve transactions at the point of sale.

It is estimated that Americans now carry about 275 million credit cards of all types, including 55 million bank cards, 120 million retail store cards and five million travel-and-entertainment cards. In 1970, the volume of charges on bank cards alone topped $7 billion.

In the area of credit authorization, the techniques employed by POS systems are similar to those used in merchandise control. An optically or magnetically coded credit card is read by the terminal.

All too often, POS system proposals rest heavily on credit authorization capabilities for their cost justification. There are plenty of alternate methods of credit checking available, some of them are a good deal less costly than POS terminals. When considering an automated system, the retailer should definitely investigate alternative means of checking credit.

Recognizing that the technical considerations associated with evaluation of POS equipment are horrendous, a retailer should request proposals from the various manufacturers which adhere to some simple criteria. Examples of these criteria are the reliability of the system and the response time which is acceptable.

Typically, reliability would be in the 99% range and response time would be zero to five seconds maximum. Given these criteria, it is up to the manufacturer to come in with a proposal which specifies the price he will charge in order to meet them. This approach enables a retailer to compare alternative proposals without becoming unduly involved in detailed technical considerations.

Above all, it should be kept in mind that a POS decision for the typical retail operation is an extremely complex one, involving many disciplines such as operations, personnel, accounting and finance, merchandising, statistical and inventory control, warehousing, receiving, marking and distribution.

It is quite likely that the decision on POS will not be made by a single individual, but will require the knowledge and expertise of many individuals within an organization. Therefore, the likelihood is that a committee will be required to assist in the evaluation and selection.

It is well known that decision by committee is generally more laborious and time-consuming than decision by an individual. Therefore, it is not too soon for retailers to form such a committee even if the implementation of POS equipment is as much as two years away.

Richard P. Sheffer is vice-president of Gambit Management Strategies, Inc., New York, a POS consulting firm.

Basic EFTS Offers Many Extras

(Continued from Page S/10)

services, not the least of which is slow acceptance of these concepts by one of the major participants: the consumer. Wherever these services, or some form of them have been offered, volume of usage has been low.

Many people have trouble understanding the service and seem to be reluctant to change from a system with which they are happy. This reluctance in turn can have the effect of impeding banks, retailers, corporate users, and equipment, communications and software vendors from making the substantial investments required to bring the EFTS revolution about. It has been found generally though that once properly exposed to most of the services, the consumer becomes an enthusiastic user.

Consumer groups and others have expressed concern over some potential negative impacts: diminished control and privacy and placing credit granting control in the hands of the few who control the system. In fact, however, those organizations which are exploring these new services appear to be very sensitive to the needs of the consumer. The Automated Clearing House Task Force of the American Bankers Association has included numerous consumer protection features into its operating rules.

Although the necessary technology for EFTS is available now, we shall probably see a slow evolutionary process toward these systems. The rate of evolution is very much dependent on consumer acceptance and other complex issues including competitive market pressures and actions by legislative and regulatory bodies.

The really significant point, however, is as the evolution to EFTS takes place, and it will, the consumer has available to him a growing set of options in the use of financial services. Competition for public use of these services should result in continually improving and innovative offerings and should ultimately make the consumer the winner in a very expensive electronic race.

Frank Curran is director of the payment system planning division at the American Bankers Association.

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Promise of Efficiency Propels Supermarkets, Retailers to POS

Retailers and supermarket chains, spurred by the need for more information to operate their businesses more efficiently and economically, are using advanced computer technology to automate store transactions. Industry sources estimate, for example, that more than 90% of all food items sold through supermarkets will carry the Universal Product Code and symbol within the next three years.

As the customer grows more discriminating and demanding, and competition for shopper patronage grows more intense, general merchandise retailers are also moving rapidly toward the automated transaction.

These two articles describing the consumer benefits of autotransaction systems in the supermarket and retail environments were written by Marvin L. Mann, store systems manager for IBM.

Consumer Benefits From Food Scanner

Special to Computerworld

The consumer will be a major beneficiary of the revolution that is breaking in retailing. Shoppers at the nation's supermarkets will save time, enjoy better service and find it easier to buy products of their choice and then account for the cost of every item bought and every penny spent.

The catalyst for change in retail store methods is the automated transaction and the system that supports it. Several sophisticated electronic developments are involved: point-of-sale terminals that go beyond traditional cash register functions and double as on-line data entry and retrieval units, scanners that "read" a Universal Product Code symbol or a magnetic striped merchandise ticket to instantly identify and price items purchased, display devices that show customers exactly what they are buying and how much they will pay item by item, and an in-store controller that accumulates and stores vital accounting and merchandising information from a store's point-of-sale terminals and transfers this data to a remote central computer.

Focal point of the rapidly emerging retailing revolution, insofar as the shopper is concerned, will be the supermarket checkout station or the store sales register. Here the customer will experience the most dramatic evidence and benefits of change, because virtually every advantage that accrues to retail stores using the new systems translates into a corresponding advantage for store patrons.

Supermarket systems offer consumer benefits starting with a substantial amount of time saved in getting through a store's checkout counter. Some systems use a high-speed optical scanner, set flush with the counter at the end of a checkstand. They use a laser light source to read the UPC symbol printed on packages to identify the product and its manufacturer. The code price, description and tax status is retrieved, displayed and printed. This relieves the checker of register keying and arithmetic functions.

To register the UPC-coded item, the checker simply pulls it from any angle across the omnidirectional optical scanning window, checks and bags it in one swift, continuous motion. The system even tracks multiple-priced items and mix and match items, regardless of the scan sequence.

If an item is not UPC-coded, the checker simply keys in the price. If a shopper decides against a purchase after the item has been registered, the checker hits a "void" key and rescans that item.

Time-consumers like bottle refunds and cash refund transactions are handled much faster. There is no ticket writing,

(Continued on Page S/14)

Tag Reader Completes Each Sale in Seconds

Special to Computerworld

Many customer benefits that derive from the supermarket point-of-sale systems also apply to retail store systems. These systems can capture information anywhere in the retail store – from the receiving dock to the point of sale – and give the various departments of a retail store direct, immediate access to a computer.

Again, the most obvious and direct advantage to the customer is at the place where he or she interacts with the system – the point of sale and, again, the advantage is multi-faceted – a faster and more efficient sales transaction, improved accuracy in purchase pricing and improved accountability for merchandise bought and money spent. The point-of-sale terminal acts as both an advanced cash register and computer terminal to speed and expand sales floor service to customers.

Terminal Reads Ticket

The retail merchandising operation does not use a standard manufacturer-imprinted scannable product code to identify the product, but rather a machine-readable merchandise ticket, scanned by such devices as a hand-held wand. In a typical sales transaction, the sales clerk simply passes the wand over the merchandise ticket. The wand can read ticket data from left to right, right to left, even upside down, without removing the ticket from the merchandise.

As the sales clerk "wands" the purchase item, the terminal reads and records the encoded data describing the item, displays the item price, computes the amount due including applicable taxes, calculates the change due and prints a detailed cash receipt. This all takes place in seconds. Even more time is saved by the system handling the mathematics of complex transactions such as the purchase of just two units of a "three for $1.99" item, or a return allowance for an item originally discounted from its initial price.

Credit purchases are handled just as easily. The hand-held wand can read the store's encoded credit cards and make a swift, automatic check for any credit holds or unauthorized card purchases. The terminal itself provides the guidance for even an inexperienced salesperson to complete virtually any transaction – purchase or return, cash or credit.

The system has significant customer service potential where "big ticket" merchandise is concerned. Using the same terminal, a salesperson can inquire directly into central computer files to locate and reserve a "big ticket" item. Delivery arrangements can be confirmed and scheduled, and special instructions

(Continued on Page S/14)

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Statistics on Demand

Restaurants Account for Sales by Item, Time of Day

By Kevin Sroub
Special to Computerworld

CLEVELAND – Minicomputer-based terminals are replacing cash registers in restaurants across the country. These terminals not only control the cash drawers but automatically account for sales by product, by time of day and by waitress. They report inventory, cost of goods sold and profitability, and produce these control statistics on demand.

Terminals range in price from only slightly more than a standard cash register to $30,000 to $40,000 for a system to control a motel-restaurant-coffee shop complex.

Results to restaurant patrons are improved service and price stability due to better control of cash and food. And to restaurant operators, higher profits result from less bookkeeping, fewer errors and less employee training and price memorization.

'Factory Programmed'

Taking advantage of state-of-the-art electronics, food and lodging computer cash registers combine the long-standing concept of turnkey program packaging with the flexibility of a programmable device. These registers are usually "factory programmed" to fit a variety of applications and, since no restaurant operates exactly like any other, programs are tailored to users' needs.

Program parameters are 6-decimal-byte-oriented with the same paging and I/O techniques characteristic of general-purpose minis. In some cases such as price changes, tax changes or menu revisions, program modification can be effected by the restaurant manager through the keyboard or via an optically scanned document.

Some users have trained their own personnel to program the terminals and a few have even learned to service the systems. Even in these advanced cases, however, the burden of hardware and software maintenance and updating is on the supplier.

The most comprehensive food service electronic registers are adaptations of commercially available minicomputers or are original designs based on commercial minisystems. Qualifications for programmers for POS food service terminals are the same as those for any user of assembly language computers.

In some cases, program input is factory "hardwired" – these are the least flexible cases. In others, program input is accomplished through paper tape readers with the object program having been compiled on a mainframe computer.

In the hardwired cases, the user has little or no control over program changes – indeed, he may not even be aware that a change is possible. In the visibly programmable systems more flexibility is available for the restaurant operator but at the expense of cost-time delays as the terminals are adapted to his particular needs.

Customer Comes First

Restaurant operators had been traditionally service-oriented and only secondarily businessmen. This was a natural outgrowth of their daily contact with their customers in an informal environment. Pricing, billing and menu changes were the rule rather than the exception. Indeed the typical restaurant owner was (and still is) proud of his personal attention to the needs of his customers, even if at times he knew these variances were affecting his profits. He figured he'd make profit up on volume.

In the late 1950s and early 1960s, business-oriented managers started taking a look at what could be done to further serve customers and still improve on profit margins that prevailed in the industry.

The conclusion was that the formula for success centers on controls. Control in a restaurant, done properly, is time-consuming and frequently neglected. Among other items it must include:

- Cash control – balancing of recorded sales to cash and receipts.
- Food control – food inventory accounting by menu item.
- Menu payback – product cost of menu item compared to revenues by item.
- Employee timekeeping.

With soaring food and labor costs, control procedures have become more important than ever. Thus it was that restaurateurs welcomed the automatic controls provided by computer terminals.

Terminal inputs are made through keyboards with keys identified by product, price and tax. These systems also include a scanner version which optically scans a menu check.

The systems are easy to operate and result in little if any disruption of a store's routine. Quite the opposite in fact – the controls built in frequently allow the manager to streamline his operation with the peace of mind that he is still in charge.

The emergence of the computer in this service market is another highly visible sign of the favorable effect of automation on our everyday lives. And whether the restaurant is termed fast food, steak house or elegant – there is a terminal-oriented management information program available to speed necessary control functions.

Kevin Sroub is POS marketing manager at Addressograph Multigraph Corp.

Consumers Win Rewards of Grocery Product Scanners

(Continued from Page S/13)

just an entry of the refund code and amount via the terminal keyboard. The system handles coupon redemption, trading stamp allocation, even food stamp purchase transactions – all via fast keyboard entry.

Customer check cashing or check payment authorization is accomplished by keyboard inquiry into the on-line authorization records file. Our studies indicate that the typical checkout transaction can be about 30% faster.

Not only can the point-of-sale terminal system expedite the individual shopper's checkout transaction, it can also contribute to faster movement of overall checkstand traffic. The in-store controller is continuously capturing data from the terminals – data that reflects shopping patterns by customer, item and time segment. Using this data, store managers will be able to tailor checkout operations to variable traffic patterns and minimize long waiting lines.

In addition to time savings, the shopper will benefit from the system's pricing accuracy on both individual items and the total purchase transaction. And during the checkout process, the customer will instantly see a display of each item purchased and price on a visual display panel.

The tape the shopper receives from the point-of-sale terminal lists the name or description of every item bought and its price. It can also include information on item tax, total amount due, amount tendered by the customer, amount of change returned, date, time and checkstand number.

The receipt enables customers to easily check items purchased and total costs. Shoppers can retain dated receipt tapes and compare item prices with those from the previous day's tapes, or take tapes with them on the next shopping trip as a comparative pricing guide.

Electronic accuracy is significant also in the checkout of multiple-priced items (five cans of soup for 89 cents) and mix and match items (six jars of different kinds of a manufacturer's baby foods). The systems insure that the customer always gets the full price discount.

Nor can the shopper miss special or promotional price reductions, which may happen in a manual operation when the stock clerks fail to mark reduced prices on item containers. With the automated system, new prices – both increases and decreases – are immediately reflected in the computer files. Only the shelf price label has to be changed.

Speed, accuracy and accountability in checkstand transactions are obvious customer benefits of the new automated transaction systems. But there are other less obvious benefits which are just as important. For example, the store customer will probably be confronted with fewer out-of-stock situations. The system continuously tracks item movement and has a direct computer tie-in for automatic order placement.

Item volume and velocity data will allow store managers to pinpoint fast- and slow-moving products, and stock a wider variety and/or a greater inventory of the more popular product. Working with this information, managers will have more information available to adjust shelf allocations, floor and island displays so that more popular products are conveniently available to shoppers.

The retail chain operation will be able to match product classification and product item sales volume and velocity data with the demographics of an individual store's local marketplace. The net result should be a greater ability to stock appropriate products, in the right quantities, stores and times to assure the highest possible customer service level.

Hand-held wand records price tag information in IBM 3653 POS terminal.

IBM 3660 supermarket system provides for keyboard entry of items not marked with Universal Product Code.

Sales Complete in Seconds

(Continued from Page S/13)

such as upholstery material for a sofa or color for a refrigerator are easily handled with a minimum of delay to the customer.

In addition to saving time in the purchase transaction, the customer is assured of paying the most current price for an item. For example, any markdown price would be immediately reflected on master price files stored in the in-store controller on-line to the terminal. And the sales receipt from the terminal can give the customer a clear record of the purchase transaction: item descriptions and prices, refund credit, taxes, total charge, amount tendered in payment and change returned.

Because every sales transaction made on the terminal is instantly relayed to the in-store controller, accurate inventory information is always available to department heads, again improving customer service. The ready access to information on merchandise movement, in turn, helps store buyers keep up with demand trends and customer buying patterns so that desired merchandise is more often available from stock.

There is also a contribution to better customer service on the incoming merchandise end. The on-line communications capabilities of the in-store terminal devices at receiving and ticketing departments enable stock receipts to be instantly reflected in available inventory. Merchandise can therefore be more quickly ticketed and ready for the sales floor.

There is a definite customer advantage, too, in the plain English, rather than coded item descriptions and prices printed on the merchandise tickets by the ticket unit, which also encodes data on the magnetic stripe.

The new retail system offers the store an opportunity to improve productivity, and to effect merchandise cost savings through more efficient buying and inventory management.

UPC Vital for Success of Store Checkout

By Herbert Eisenberg
Special to Computerworld

The adoption of the Universal Product Code (UPC) has ushered in a new era for the food industry. The combination of the UPC and scanning systems to read the code will provide benefits to the consumer, the supermarket operator, his employees and the food manufacturer.

The UPC code for grocery items consists of a version number, 10 digits, plus a modulo check digit. The first five digits represent the manufacturer and the next five digits represent the item. The industry expects to have 50% of grocery items marked by the manufacturer by the end of 1974. This is called source symbol marking.

In-store labeling devices for variable measure items such as prepackaged meats and produce are now available. These label makers are electronically interfaced with scales in the back rooms of the supermarkets. As the human-readable label is attached to the top of a package of meat, for example, a scannable symbol will be put on the bottom of the package.

Consequently, with 50% source symbol marking on grocery packages, plus symbol marking on variable measure items which will generally be 175-30% of movement through the store, it is clear that the consumer will begin to see scanning installations by the fall of 1974.

Why is the supermarket operator interested in the installation of automated checkstands? The benefits to the store owner fall into two categories. The industry calls these "hard" benefits and "soft" benefits.

"Hard" benefits are those quantifiable savings generated in the store itself by the installation of scanning systems. "Soft" savings will be developed over time by the judicious use of the data generated at the front end to provide better inventory control, merchandising and management controls.

Hard savings include:

- Productivity gains at the checkout.
- Elimination of price marking on individual items and elimination of remarking.
- Reduced training of checkers.
- Greater accuracy.
- Office labor savings in bookkeeping.

One live test in an actual store environment was conducted in a Kroger supermarket at the Kenwood Shopping Center in Cincinnati, Ohio. It was the culmination of six years of development effort, initially as a project within RCA and then as a division of Sperry Univac.

The hard savings results of the test were:

- Scan and bag was 45% faster than ring and bag.
- Checkers made 75% fewer mistakes.
- New checkers achieved level performance with a minimum of training. There was no measurable learning curve.

Many chain operators will agree, however, that the soft benefits will eventually equal or surpass the in-store hard benefits. More accurate and timely item movement data, for example, could change present merchandising concepts. The product mix in specific stores could be more finely tuned to the demographics and shopper preferences in that particular store. A more accurate job of shelf allocation will be done to maximize profits *and* customer satisfaction.

With respect to the consumer, he or she will also benefit from the installation of this system. Better merchandising techniques will permit the grocer to be more responsive to the shopper's product needs. Better inventory control at the store will reduce stock outages so the customer will be able to find and purchase the product he or she wishes.

Checkout through the front end will be faster. In the Kroger test, the shopper waiting time at the checkstand – presently one of the major consumer complaints – decreased 40%.

Finally, the customer receipt will provide the consumer with much more information than he presently receives. It will include the item price, store department, a taxable indicator, multiple-item purchase, credit type (refund, store coupon, etc.), amount and method of payment (cash, check, etc.), amount of change, and for each item, either the last five digits of the UPC number for specific positive correlation or an alphabetic descriptor for each item.

The store checkers prefer the automated scanning checkstands also. It makes their jobs easier – they have to remember less data. This gives them more time to chat with the customer which both the checker and the customer enjoy. Shopping and checking out becomes a more pleasant experience for everyone concerned.

In summary, the installation of scanning checkout systems, made possible by the UPC, will provide benefits to all concerned. The operator will achieve cost savings, leading to greater profitability. The checker will have an easier, more enjoyable job. The food manufacturer will have very accurate data on his product movement. The consumer will be served better and be provided with extensive information on the sales receipt. With all this going for it, the future for automated checkouts in supermarkets is now.

Herbert Eisenberg is manager for point-of-sale marketing with Sperry Univac.

Sperry Univac Accuscan supermarket checkout system uses a fixed laser beam optical reader at the end of the checksland to scan Universal Product Code (UPC) symbols on items.

(Advertisement)

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Roy Freed has specialized in computer-related legal matters for many years. He has served as inside counsel for a major manufacturer of digital computers, and is currently engaged in private practice with a prominent Boston law firm.

He has authored many articles on the various legal aspects of computers – including "Computer Frauds – A Management Trap" *(Business Horizons)* and a book entitled "Computers and Law – A Reference Work." Mr. Freed will personally conduct the entire seminar.

Should you attend this seminar?

If you're involved in the purchase of EDP equipment or services, the answer is a resounding "yes." Whether you're a corporate counsel, contract administrator, DP manager, consultant or officer of a using firm, this seminar will pay for itself many times over. You just have to read the pages of *Computerworld* to realize how frequent supplier problems are – and how costly and disruptive they can be. This seminar can help you get what you want when you want it. It will help your company, your industry and you!

Times, places and cost

There is still one more seminar scheduled this spring.

May 22-24—St. Francis San Francisco

Total cost for the entire seminar, including the complete resource notebook, continental breakfasts, lunches and coffee breaks, is $295.00. Hotel rooms, if required, are not included.

Note: Enrollment must be strictly limited, and our other seminars were sold out. So don't wait until it's too late to enroll.

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Heavy Emphasis on Technology Obscures Advantages to Shopper

By Dan. A. Barnes
Special to Computerworld

The heavy concentration of interest on the technology of point-of-sale terminals has obscured the advantages of new systems that will benefit the shopping public.

A terminal, as everyone knows, is an input or output device (or a combination of both) that is remote from the computer. In effect, terminals are the interface between man and the computer.

Today, there are many different types of terminals in use. Some resemble typewriters, adding machines or cash registers. Some employ CRTs and other display devices. Some are specially designed for a particular application. Retail terminals process the sales transaction, capture merchandising information and also assist in the authorization of credit.

Despite the wide variety of data terminals, their basic functions are similar. They capture data on the spot and send it to a remote computer. In return, the terminals receive information from the computer and give it to the salesperson for use.

There are several reasons why retailers in general are considering using terminals.

First, the retailer wants to be able to verify a customer's credit standing automatically at the time a charge sale is recorded.

Second, the retailer wants to capture sales statistics by departments, reorder information, salesperson commission information, productivity information and the details necessary to automate the billing of accounts receivable. This data is accumulated as a by-product of handling the sales transaction.

Third, the retailer expects his electronic system to be flexible and expandable so that functions can be added as his needs increase.

The retailer is also interested in terminals because he has distinct fears that his present system of serving customers might become obsolete. In a highly competitive market, other retailers might gain an advantage by adopting a new electronic system with certain advantages.

How About Consumer?

These are the advantages to the retailer, but the reason for implementing these systems is to improve service to shoppers. How is this accomplished?

A point-of-sale terminal speeds up the transaction. It is not the scope of this article to cover the reasons why shopping time is limited; it is enough to observe that shoppers from coast to coast want faster service at the point of sale.

The actual design of POS terminals is oriented to improving the speed of entering figures. For example, the use of SKU numbers eliminates the pulling of price tags, eliminates the writing of sales slips and eliminates the mental arithmetic of the transaction, which includes figuring the change.

Further, those figures that can be read electronically by a wand reader have long been recognized as the most troublesome in retailing, so far as errors are concerned. Eliminating the manual indexing speeds the transaction and eliminates the errors.

A second factor influencing the design of a POS system is the celebrated credit revolution. Controlling credit through proper authorization becomes just as important as accurate billing.

With most retailers, the first question to be asked about a new system is, "Will it help the customer?" When examining the subject of credit authorization, perhaps the question should be extended thus: "Will it help the customer keep shopping longer?"

Today's systems are designed with local shopping practices in mind, particularly the desires of the retailer. Procedures for credit authorization are shaped to fit local competitive situations as well.

At The Hecht Co. in Baltimore, for example, each POS terminal communicates directly with a mainframe through a minicomputer. An audit trail on magnetic tape is provided by the minicomputer.

Charge transactions involving collections and fraud accounts are not accepted by the computer and are voided by the terminal. The void condition will appear on the display panel as a three-digit referral number. The salesperson then calls a credit authorizer.

The credit authorizer uses various methods at his disposal to determine whether a sale should be approved or rejected. Basically, bank check control is handled in the same manner as credit. On both kinds of transaction the customer receives fast, convenient service, and the store has complete control of the transaction.

Clerk is handling an exception item in on-line credit authorization system at Nordstrom's in Seattle.

Automatic credit authorization at Korvette's in New York is handled similarly. Transactions on Korvette's charge plates are positive; bank cards are still handled on a negative basis. While most charge sales are handled without need for referral, when there is a problem, the computer sends a referral code back to the terminal.

The cashier at Korvette's has the option of waiving the inquiry, which is a method that has worked out well for the store, and also, of course, for the shopper.

Where trading practices in a shopping area demand that a retailer accept several different credit cards, the credit authorization system can be designed with the features that suit the retailer. This enables a retailer to offer the shopper the conveniences he expects. The retailer can write his own rules, but they are rules that must be accepted by his customers.

With modern POS systems, the financial and merchandising divisions of a store are both fully represented by a single system. Both receive all the detailed information on each sales transaction they need. As a result, the movement of merchandise and the current inventory position can be watched as closely as the bank account.

It takes a merchandise manager or buyer to appreciate the value of having such information available quickly and accurately. Some retailers have had a way of saying, "If we are 90% accurate, that's good enough for merchandise planning." This is questionable today. Buyers, merchandise managers and salespeople know that 90% is not good enough for customer service. An item missing from the assortment in a wanted size, style or color represents a lost sale, a lost profit and – too often – a lost customer. A retailer can never underestimate the mobility of the customer in today's society.

By generating both merchandise and financial control information as automatic by-products of sales recording, POS makes possible much more desirable service levels, while guarding against excessive inventory investment and obsolescence.

A cornerstone of the POS system is obviously the detail recorded at the time of sale. Because the coded tag on the item selected by the customer is the basis for ringing up the sale, it is also the basis for whatever management reports are generated later. Therefore all of the system controls are designed to assure proper merchandising input.

The installation of staple stock reordering systems and the installation of fashion reporting systems are elaborate subjects in themselves, of course. Yet when a retailer understands that these systems function for the benefit of the shopping public, then maximum efficiency is attained. A POS system does not reduce the responsibility of the buyer; rather, it gives him the tools to function more efficiently.

Dan A. Barnes is director of retail corporate accounts with NCR.

Complete Coverage of the National Computer Conference in three issues of Computerworld.

Computerworld covers NCC as only a weekly can.

Only a newsweekly can give you up-to-date, last-minute coverage of NCC. And that's just what we'll be doing in three issues of *Computerworld*. Our Preview, Show and Wrap-Up Issues will tell you what's going to happen, what's happening, and how it all went in Chicago this year. And it will all be current, useful information. So make sure that *Computerworld* is part of your NCC plans.

If you're an advertiser, you should also note that we'll be distributing extra copies of *Computerworld* right at the show. So you'll get more readership than ever. Issue and closing dates are below. For more information, just contact your *Computerworld* representative. Or call or write Judy Milford at *Computerworld*, 797 Washington Street, Newton, Mass. 02160 (617) 965-5800.

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NCC Show Issue	May 8	April 19	April 26
NCC Wrap-Up Issue	May 15	April 26	May 3

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Eurocomp to Stress Business DP Uses

UXBRIDGE, England – Business and Commercial applications of computers will be the major areas of emphasis at the First European Computing Congress, May 13-17, at Brunel University.

Among the Eurocomp sessions of interest to senior management will be those on computers and society; financial and corporate planning; small systems in business; and production control.

Sessions planned with the DP specialist in mind include systems design and analysis; application packages; information security; and data base applications.

Minicomputers; networks and communications; and man/machine interaction will be covered in detail for the computer scientist, while the more general issues of ethics and professionalism, and privacy and standardization will be treated in discussion sessions.

Societies/ User Groups

Full-Scale Trade Show

Eurocomp will also offer a full-scale trade show with exhibits of hardware, peripherals and services. Among the companies exhibiting are Burroughs, IBM, Honeywell, ICL, Nixdorf, Philips and Rank XDS.

Further information on fees and the conference is available from Online, Brunel University, Uxbridge, Middlesex, England.

COM to Get Once-Over in Boston

BOSTON – A total systems review of computer output microfilming (COM) is being offered at Micromedia Horizons '74, sponsored by the National Microfilm Association.

The conference, May 7-10, will be held at the John B. Hynes Auditorium and Convention Center. Registration is $75, which includes NMA membership.

The first day's program includes an introduction to COM, covering hardware, software and standards. Information about COM as a systems tool and the tradeoffs between COM service bureaus and in-house facilities will also be presented.

"Selling COM to Management" and "Integrated Systems – COM and Source Documents" are sessions scheduled for the second day.

A case history entitled "Computer vs. Microfilm Retrieval" will be presented by AT&T.

Thursday's program covers COM software; taking a look at packages available for integration with application programs; generalized reformat programs; and minicomputer formatters.

Further information can be had from John B. Bidwell, 8728 Colesville Rd., Silver Spring, Md. 20910.

Calendar

May 2-3, Philadelphia – National Information Retrieval Colloquium. Contact: P.O. Box 15847, 19103.

May 2-7, Freeport, Grand Bahamas – Computer Dealers Association, Contact: Harvey N. Berlent, c/o N.B. Marketing Co., 3505 Knight St., Oceanside, N.Y. 11572.

May 7-10, New York – Association for Educational Data Systems Annual Convention. Contact AEDS Headquarters, 1201 Sixteenth St., N.W., Washington, D.C. 20036.

Adapso Session To Focus on S/3

LAS VEGAS – How to meet the challenges of System/3 in the marketplace will be emphasized at Adapso's 40th Management Conference, May 1-3, at Caesar's Palace.

The conference will feature five concurrent workshops including "A Strategy for System/3 and Similar Competitors"; "Data Entry"; "Network Information Systems"; "Services vs. Products – Package vs. Custom"; and "Taxation Without Representation."

Two other sessions of interest will deal with the methods and problems of doing business with the Federal Government and look at the DBTG-recommended Data Base System.

The registration fee for members is $100 and $175 for non-members. Detailed information may be obtained from Adapso, 551 Fifth Ave., New York, 10017.

Our New York Office has just crossed a bridge.

Don Fagan and Frank Gallo, *Computerworld's* intrepid Eastern Regional salesmen, have pitched a new office. They can now be found overlooking the toll booths of the George Washington Bridge in Fort Lee, New Jersey – just 20 minutes from downtown Manhattan. Their new address is below and they'd be glad to hear from you any time.

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COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

You're in EDP and you've got an information retrieval problem. You're considering moving some routines from paper to terminals. Or maybe you're already using terminals but you've got to enlarge your system.

STOP! Those terminal ads that talk costs don't talk true costs. They omit all kinds of high expense items like software development, installation, computer time, and the cost of training skilled operators. And they sure steer clear of giving you any kind of explanation about what happens to you when the computer to switch to computer output microfilm (COM).

COM is by far the hottest alternative going to many online CRT systems. And EDP managers throughout the country have judged Quantor's 105 COM System to be superior to all the others on the market. You just take your computer tape, mount it on the Quantor 105, and four minutes later you have your first 4"x6" microfiche containing as much information as you get on 269 pages of computer printout. After the first fiche, the Quantor 105 produces fiche at the rate of

tains its own dark room; yet it's portable enough for us to roll it into an office for a demonstration. That means no additional dark room space, no messing with chemicals, no expensive plumbing installations. The Quantor 105 is self-contained and anyone can learn to use it in less than an hour.

And the COM microfiche terminal not only gives your operators more information at a glance, it is so smart that it stays up when the computer goes down.

Managers in professions

communications, among others, have chosen Quantor COM.

That's why if you only need to update your data on a daily basis, you owe it to yourself to examine the advantages of our offline microfiche system. Rip off the coupon on this page, and we'll send you a free copy of the Auerbach Report on the Quantor 105. Then we'll explain to you how our COM system will pay for itself while it solves your information distribution needs in your particular industry. If you like what you hear and you're serious

we'll show

THE GREAT TERMINAL RIPOFF.

"My team evaluated every Database Management system going. We picked IDMS and the choice was easy. Here's why."

William Casey*

"I know exactly how you feel about choosing the right Database Management system because I've done it. You think it'll be a tough decision. We thought so too... but it wasn't.

My team (from a large insurance company) surveyed the entire field, then boiled it down to five Database Management systems and two File Management systems.

We started out completely impartial. But from the first one system kept standing out: IDMS. It offered many features that simply weren't available on other, much larger, systems, yet it had an overhead figure of only 50 K.

Its variety of data placement techniques, its unrestricted facilities for logically relating all data under its control, its provision for an unlimited number of database entry points, and its superior space management approach amounted to both a substantial performance edge and a flexible database architecture advantage.

With data independence established by means of separate schema and subschema compilers, we realized that many applications programs would no longer depend on data definitions they themselves employed.

From a programming point of view, the system was miles ahead of its competition. Example: IDMS's DML processor inserts all necessary data record descriptions directly into the user's COBOL program and allows use of database-oriented verbs, such as FIND, OBTAIN, or STORE.

We were pleased to find that IDMS is the only system currently running on IBM (OS and DOS) and Univac Spectra equipment that corresponds to the CODASYL DBTG specification of April 1971. Machine independence is always an important consideration, and IDMS represented the perfect answer to that issue.

Also, the IDMS/CULPRIT retrieval system, running from the same data definitions that the user established to create his database network, provides unlimited database access facilities for reporting purposes.

We found the documentation was beautifully done – complete and well-presented. The users we contacted were most enthusiastic about the system and confirmed what we'd heard – that the Cullinane Corporation has an outstanding reputation for support.

If you're serious about Database Management you have to look seriously at IDMS. And right now there are three easy ways to do it: (1) Write or phone for a technical brochure, (2) Attend a Cullinane seminar on IDMS at the Computer Caravan city nearest you (see schedule below), (3) Call me, William Casey, and if my travel schedule permits, I'll personally show you exactly how we compared the various choices and why we picked IDMS. You see – I liked IDMS so much I joined the Cullinane Team.

CARAVAN CITY	EDP-AUDITOR/CULPRIT SEMINAR	IDMS SEMINAR
Charlotte	April 24 (3:30-4:30 PM)	April 25 (9 AM-Noon)
New York	May 1 (3:30-4:30 PM)	May 2 (9 AM-Noon)

NATIONAL COMPUTER CONFERENCE		
Chicago – at John Evers Theatre, McCormick Place. Site of NCC show.	May 8 (9-10 AM)	May 7 (9 AM-Noon) May 8 (11-2 PM)

***About William Casey**

A Magna Cum Laude graduate from Lafayette College who also attended Webb Institute of Naval Architecture, William Casey has extensive experience in systems design, programming and implementation of large systems.

Now a member of the IDMS technical team, he was responsible for developing the special versions of the EDP-AUDITOR/CULPRIT retrieval systems for use with IDMS.

Cullinane Corporation

One Boston Place, Boston, Massachusetts 02108. Phone: (617) 742-8656

Wastebaskets Have Role in Security

TORONTO – One way to determine the security of your computer system is to check it against the following list of security "musts":

- Keep the computer room reasonably neat and orderly at all times, and ensure that corridors and spaces around the computer equipment are free of obstacles.
- Use tall wastebaskets with lids in areas where valuable documents could accidentally fall in.
- Inspect wastebasket contents regularly to see if they contain anything which is a potential security risk.
- Destroy wastebasket contents, such as teletypewriter ribbons, and carbon paper containing sensitive information, using a paper-shredding machine.
- Store only a limited supply of combustible paper in the computer room; store additional supplies in a fire-protected storage area away from the computer equipment.
- Protect tape reels and disk packs in containers which have good insulating properties, and store tapes and disks in their containers in their proper places when not in use.
- Prohibit the bringing of food and beverages into the computer room and library.
- Lock desks and filing cabinets after normal working hours and clear desk tops.
- Provide sufficient ashtrays in those areas where smoking is permitted.

This checklist was compiled by DCF Systems Ltd., 74 Victoria St., Toronto, Ont. M5C 2A5.

What's New in Social Sciences?

PHILADELPHIA – Want to keep up with the latest developments in your field? A large-scale computerized literature-sierting service is now available to researchers and librarians working in the social sciences.

The service, Automated Subject Citation Alert, is provided by the Institute for Scientific Information (ISI) and will search through 3,500 of the world's most important journals.

Each article is indexed by author, author's organization, and by words, word-phrases and word-stems that appear in the journal titles. In addition, each article is indexed by its references to previous publications on the topic.

Subscribers may select those topics which are of interest to them from a list of over 100 including drug addiction, behavior genetics and verbal learning. This service called Ascatopics costs $95 per year.

For those whose interests are very specialized, an ISI information specialist will help develop a custom search profile which precisely defines the subscriber's topic. This service, designated Asca, costs a minimum of $115 per year. ISI is at 325 Chestnut St., 19106.

Swedes Ask, What Pollution?

STOCKHOLM – Using data compiled by computer, Swedish scientists have drawn up a series of maps giving a nationwide picture of the water pollution situation in the country.

The study of 1,250 lakes conducted by the National Swedish Environment Protection Board revealed that less than 10% of Sweden's 98,000 lakes are polluted to any "serious" extent.

In addition to using depth-visibility as an indicator of pollution in the lakes, the survey collected data on phosphorus, nitrogen, salt, oxygen, alkali, and acid content and the lakes' sizes and locations.

Most of the badly polluted lakes are in southern Sweden in densely populated areas, the study found.

Test Screens For Brain Harm

LONDON – The incidence of brain damage in newborn children may be reduced to almost zero in the next five years thanks to a computer analysis technique.

Dr. Tim Chard of St. Bartholomew's Hospital here has devised a method to computerize what was previously an impractical, expensive blood test that measured the amount of a hormone called "placental lactogen" in pregnant women.

Before Chard computerized the test, it took a highly trained lab technician two full days to complete the analysis. Now a single technician can perform 1,500 tests a day and at a cost of only $4.40 for the complete tests.

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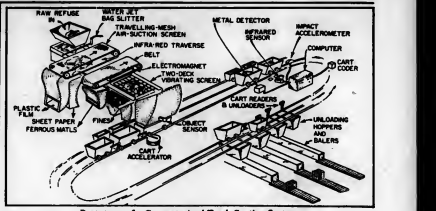

Prototype of a Computerized Trash-Sorting System

Mini Ensures Waste Not Wasted

CAMBRIDGE, Mass. — As the steady decline in minicomputer prices opens up more application areas, some minis are winding up in the garbage dump – but not as refuse.

What they are doing is helping to perform an important ecological role in balancing community waste disposal by controlling a garbage-sorting system designed to aid communities in screening out recyclable solid waste from useless rubbish.

Professors at MIT have packaged Computer Automation's Alpha 16 minicomputer into an electrical/mechanical system that takes pure, unadulterated trash and sorts it into different categories, immediately identifying waste for disposal or recycling.

As a result, the MIT group sees a broad potential for computer-driven trash sorters in communities throughout the nation, particularly those which are very short of disposal sites.

It all started with Dr. David Gordon Wilson, a professor of mechanical engineering at MIT, who initiated the trash sorting project in the summer of 1969 under a grant from the Environmental Protection Agency. Dr. Stephen D. Senturia, who later joined the project, was convinced that low-cost minicomputers could help produce a feasible system.

"We have to take many sensor inputs from a wide variety of trash and make classification decisions in one-tenth of a second. The minicomputer was obviously our only answer," Wilson noted.

In the MIT trash sorting system, trash and refuse are loaded onto a wire mesh vibrating screen which shakes out objects by size into small buggies moving along an oval conveyor, which begins the sorting of the main trash stream into several independent streams of categorized trash.

The objects are then moved along in their carts, passing a simple metal detector.

An infrared spectrometer identifies and sorts objects by material such as cellulose, plastic, glass and a variety of metals. An impact sensor with an accelerator and small hammer distinguishes between such materials as wood and paper.

The mini keeps track of which set of data goes with which buggy and processes the data to control unloading switches that cause the classified garbage to be dumped into separate bins.

The minicomputer monitors four carts simultaneously as they pass through the sensor station and performs calculations to classify the contents of each one.

"We shoot these carts through the monitoring process at the rate of three per second per station to their proper unloading areas," Senturia explained.

It's not nice to fool IBM.

But we had to simplify the communications tangle.

It's certainly not IBM's fault that datacomm was designed for teletypewriter I/O. The "dataset-line-dataset" standard of the telegraph business was adopted by the computer industry because everybody thought voice-grade speeds would be more than enough. That serial standard was incompatible with the computer's operation, so the communications controller and its high-overhead software were invented. Until now, that's how computer systems have had to live with the limitations of communications technology.

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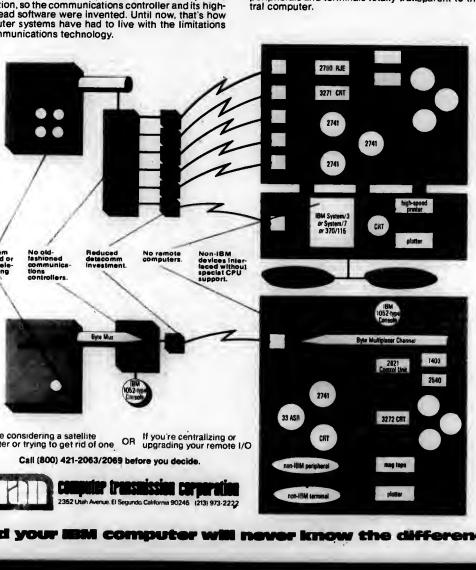

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COMPUTER INDUSTRY

CI Notes

Mergers Decline Slightly

CHICAGO – While the computer industry experienced a 5% drop in the number of mergers during 1973, the mergers in industry as a whole declined 16%, according to figures from W.T. Grimm & Co., a financial consulting firm.

There were 77 merger announcements in the DP field compared with 81 in 1972. Of these, 31 were for cash, 15 for stock and eight for a combination of cash, stock or debt, Grimm said.

Search Plans Nonprofit Unit

SACRAMENTO, Calif. – Project Search plans to establish a nonprofit corporation to provide staff services and handle project funds.

Search plans to apply for continued Law Enforcement Assistance Administration (LEAA) support of its projects dealing with the application of advanced technology in criminal justice and for the new corporation, designated Search Group, Inc.

Manufacturers Chooses Olivetti

NEW YORK – Manufacturers Hanover Trust has ordered 250 Model TC 380 teller terminals from Olivetti Corp. of America for installation in 173 branches.

The buffered intelligent terminals, which will be connected via telephone lines to the bank's IBM 370/165s, will be utilized initially in all savings account transactions.

Supershorts

Artec International Corp. has been formed to provide service, parts and supplies to owners of automatic typewriters and word processors previously manufactured by Dura and Itel.

DC Industries Pty. Ltd., Australia, has been appointed sales and service representative for the Documate II microfilming systems produced by Terminal Data Corp.

International Computer Trading Corp., San Francisco, is offering studies of the European market for specific companies and products.

Informatics, Inc.'s Information Systems Co. has been named recipient of the 1974 Information Industry Association's Hall of Fame Award for its work and contribution as prime contractor for the operation and development of the Nasa Scientific and Technical Facility for the past five years.

Measurex has received orders for more than 200 of its System 1000 process control systems for use on papermaking machines since its introduction in 1969.

New Record
'73 DP Exports Rise 32%

WASHINGTON, D.C. – It's official – computer exports were up to record heights last year rising almost 32% overall, according to the U.S. Department of Commerce.

The record exports – which totaled $1.57 billion in 1973, up from the $1.18 billion in 1972 – helped pace an overall rise in exports of business machines to new highs of $2.3 billion.

At the same time imports of computers and related equipment decreased 36.5% in the same time period totaling only $110 million during the year – the first decrease in the category since 1968.

While computers and related equipment accounted for 68% of the total of business equipment exports, they only accounted for 12.2% of the imports, again showing their importance as a contributor to a favorable balance of U.S. trade.

Exports of digital computer mainframes totaled $456 million during the year, input devices accounted for $45.8 million of the total and output equipment reached $53.9 million, according to the official Commerce figures.

At the same time, storage devices with a value of $147.6 million were exported during the year, compared with $83 million worth of the devices exported a year earlier.

Modems accounted for $1.5 million worth of exports as did multiplexers, while other computer-related communications equipment totaled just over $5 million during the year.

The major markets for the U.S. exports during the year continued to be West Germany, the UK, Japan and France, according to Commerce.

CDC Unbundles 170 Software

By Vic Farmer
Of the CW Staff

MISSISSAUGA, Ont. – CDC began separate element pricing (SEP) of all Cyber 170 software and software services, citing rising software development costs and decreasing hardware costs.

Each software element should be separately priced to reflect its unique value, according to Paul B. Miller, president of Control Data Marketing Co. This separation of all software recognizes that software is now the most important element in making further significant progress in the applications of computer systems, Miller said.

"The customer will now have a clear view of the value of all major elements of his system, and users need to be able to equate more precisely the true value of all software in relation to the fulfillment of their data processing needs," he said.

With separate pricing the user can measure more realistically the economic advantages of purchasing only the software he needs and will be able to take steps to improve the cost effectiveness of his system, Miller added.

CDC anticipates that SEP will allow the user to acquire a total system at less cost when upgrading because the user will purchase only those elements he needs, Miller said.

About 30% of the larger users will not have to buy a new operating system or make major application programming changes when they upgrade to the Cyber 170, CDC said.

A typical set of Cyber 170 software products will reflect 20% to 25% of the total system price, CDC said.

As a side effect Miller predictd that more software of high quality will come into the market from the independent suppliers and users themselves, and the competition will help software be recognized as a mature part of the industry.

In the international market Miller said SEP should encourage development of local software industries.

IBM Quarter Results Rise; Burroughs Sets Record

Burroughs scored record first quarter earnings and revenues with a "strong incoming order rate" while IBM's first quarter results were also up, reflecting a high rate of outright purchases.

Although lower than the record level in the final 1973 quarter, outright purchases of IBM equipment were at a significantly higher level than in the first quarter a year ago and contributed significantly to the 22.5% rise in income compared with the year-ago period, noted IBM Chairman Frank T. Cary.

At Burroughs, earnings rose 31% to $21.4 million or 55 cents a share, compared with $16.3 million or 43 cents a share in the year-ago period.

Revenues rose 10% to $322.8 million from $274.4 million in the same period last year.

Worldwide incoming orders advanced 28% over the 1973 first quarter. Backlogs continued to build and were 11% higher than at the beginning of the year, the firm said.

IBM Earnings Up

IBM's first quarter earnings totaled $431.3 million or $2.94 a share compared with $340.1 million or $2.34 a share, adjusted for the 25% stock split of last year.

Revenue soared to $3 billion from $2.45 billion in the year-ago period.

"While installations are expected to continue at a high level, this rate of increase in total gross income may not be maintained for the balance of the year in view of the high volume of outright purchases that occurred in the latter part of 1973," Cary observed.

Gross income from rentals and services increased 9.5% over the comparable 1973 period, he noted.

Intel Unveils 8080 CPU Chip

SANTA CLARA, Calif. – Intel Corp. has introduced its 8080 n-channel, single-chip central processor unit which is available with peripheral circuits, a new version of the Intellec 8 program development system and a set of software development packages.

The 8080 can replace multichip CPUs, custom MOS LSI circuits or large assemblies of conventional logic circuits, Intel said.

The 8080 is compatible with the 8008, whose 48 basic instructions have been retained as a subset of the 8080's 78 instruction set.

Source programs for the 8080 can be written in either Intel's programming language for microcomputers (PL/M) or its new macroassembler language.

PL/M is available on the time-sharing nets of United Computing Systems, GE and Tymshare, as well as from Intel on magnetic tape.

The 8080 can process data in a decimal mode almost as fast as in the binary mode, the firm said.

Instruction cycle time is typically 2 μsec.

The 8080 features parallel buses, on-chip decoding and TTL compatibility.

The 8080 can directly access up to 64K bytes of memory and can operate up to 256 input and 256 output channels (8 bits per channel) and handle up to eight interrupt levels, Intel said.

In a typical multiprocessor application, a number of 8080 CPUs would serve as peripheral controllers for an 8080 microcomputer system, with the CPUs sharing a common central memory, the firm added.

Other standard peripheral circuits designed especially for the 8080 include random access memories, read only memories, programmable read only memories as well as a communications interface, and a bidirectional bus driver.

In small quantities, the 8080 is priced at $360 from 3065 Bowers Ave., Santa Clara, Calif. 95051.

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Canadian Service Bureaus Had Revenues of $535 Million in '72

By Gordon D. Hutchison
Special to Computerworld

OTTAWA, Ont. – Results of an annual survey conducted by Statistics Canada put the total 1972 revenue of the computer service bureau industry in Canada at $535 million. This represents the income of 309 firms dealing specifically in the sale of data processing services.

Another 329 companies and institutions which offer data processing as a secondary service brought in $37 million.

In the past four or five years, several substantial independent service bureaus have sprung up, giving better balance to the industry than was available previously, when IBM dominated the marketplace, the survey noted.

Financial institutions received a larger percentage of the country's total service revenues than any other private sector, the survey showed, followed by manufacturing and wholesalers and retailers.

Of the $535 million, financial institutions received 19.8% or $106.2 million, while manufacturing, with 14.2% or $76.1 million, barely led wholesalers and retailers, with 14.1% or $75.2 million, the survey indicated.

Governments taken as a whole accounted for 25.7% of the revenues, while the Federal Government alone received 12.9%.

The survey reported that a total of 14,364 paid employees and 50 working proprietors were engaged by computer service companies.

During 1972, a total of 659 computers of various capacities were in use, with 629 terminals, of which 536 were of speeds of under 1,200 bit/sec. Access ports in use numbered 1,437, and of this, 1,018 were under 2,000 bit/sec.

Most companies do not capitalize their software, the survey found. Of the 90% answering this question, 15% said the question was not applicable and 65% indicated software was not capitalized.

International News

3d Party to Maintain Center for Quantas

SYDNEY, Australia – Third-party maintenance made a large gain in Australia when Qantas Airlines, which has about $1 billion worth of equipment, chose DPCE Pty. Ltd. to perform maintenance on its installation of Honeywell and IBM equipment.

The contract to DPCE, a subsidiary of Dier Computer Corp., is for three years and is valued at about $300,000, a savings of about 25% over the cost of maintenance through the vendors, according to a story in the *Australian Financial Review*.

A Qantas spokesman said, "Because of the complex integration of IBM and Honeywell equipment, Qantas has for some time felt the need for a single maintenance organization."

Qantam, the Qantas data center, includes a 360/20, four 360/65s, two HIS 632s, two HIS 516s and two 316s.

Aussies May Tighten Rules On Overseas Job Applicants

SYDNEY, Australia – Australia may not be the bed of roses for DP personnel that many expect it to be, particularly if the Department of Labor has its way.

The department is recommending that applicants for migrant visas shouldn't get jobs unless they have had two or three year's experience in DP, according to the *Australian Financial Review*.

The problem stems from the diverse experience and training of DP people from different countries.

Potential employers "should check out very carefully just what experience overseas applicants can offer," said Val Swanson, director with staff consultants, Battles and Associates. "Many countries aren't much past the unit record stages and I know of some applicants from overseas who haven't even seen a third-generation CPU, let alone a 370."

Sharing Plan Pays Off

SYDNEY, Australia – Recent efforts toward more cooperation on software among the various foreign units of Olivetti are already bearing fruit for the Australian group, according to Keith Walkerden, Olivetti Australia's director, sales and marketing.

The firm has received about 15 packages from other units, including over 200 programs, to be used on the 652 microcomputer. In addition, the Australian unit now has direct liaison with a software translation office in Tokyo.

Foreign Orders & Installations

Commonwealth Bank Orders Two 370s, Front-End Gear

SYDNEY, Australia – Commonwealth Bank has placed its second computer order for over $2 million in six weeks.

The latest order is for two IBM 370/135s, including front-end gear, to expand its on-line terminal network.

The bank previously ordered an IBM 370/158 valued at $3.4 million.

By the middle of this year, Commonwealth expects to have 750 Olivetti terminals plus 50 IBM units installed throughout Melbourne, Sydney and Brisbane. This on-line network will be extended to Adelaide and Perth by the end of the year, and will replace current data transmission in Canberra and Newcastle.

Other Foreign Orders

Izumiya Co., operator of a chain of retail stores in the Osaka, Japan, area, has ordered a Univac 1106 valued at $1.7 million. It will handle orders received from the stores, perform inventory control and purchasing functions and determine routing for shipments.

Nesbitt, Inc., London, has installed a Task/Master telecommunications monitor produced by Turnkey Systems, Inc. The equipment was installed by Hoskyns Systems Ltd.

Kredit Registration Institution, Tiel, Holland, has ordered a Burroughs B3700 and 40 TD 700 input and display terminals.

Wollongong University, Australia, has purchased a Univac 1106 to be used primarily for student instruction in data processing.

Mehr Wert Gmbh & Co., KG, Germany, has ordered 350 NCR 230 free-standing electronic sales registers.

Tatabanya Mining Co., Hungary, has ordered a DS/30 computer system from Datasab, under an agreement with Hungarian Metrimpex.

Pertec Mulls End-User Market With Undefined Unit

By Marvin Smallwiser
Of the CW Staff

LOS ANGELES – Pertec is harboring hopes of entering the end-user market. President Ryal R. Poppa said the firm might move into the end-user market in about two years with a product "undefined at this point."

Poppa expects the firm to make strong gains in the OEM market despite a write-off of about $300,000 for its line printer.

Underestimation of a rising cash demand for production of the $10 million order for large-scale CRTs from Singer caused the firm to cancel production of the line printer, which was considered to have superior potential, he said.

"We underestimated the engineering and cash requirement for the manufacturing buildup on that product line. We have been in the CRT business – small CRTs for our shared processor – for almost a year, but this was our first large-scale CRT."

Pertec, he said, plans to expand its penetration of the CRT market.

"We are satisfied we have the facilities for production.

"One of the advantages we have is that the Business Systems Division is highly automated and the CRT, because of its nature, lends itself to automation very nicely."

The primary thrust of Pertec's Business Systems Division during the next 18 months will be getting the manufacturing process well-refined and getting products out the back door, he noted.

"We are still following the same plan as before . . . to expand our penetration of the OEM market and to push the floppy disk, which is to be announced during the first half of this year, into that marketplace.

"I'm absolutely certain we can manufacture at a lower cost than any announced version of an IBM-compatible floppy," Poppa said.

The tape drive business, he said, continues to grow steadily.

"The backlog is so large that it presents us with the problem of having to squeeze our production capability to meet commitments.

"Shutting down the printer operation helps. We will take the whole printer manufacturing facility and convert it to tape and disk manufacturing," Poppa said.

Poppa said his goals at Pertec are to build on Pertec's strong engineering and customer base as well as to enlarge its market by providing more products through the same channels.

He also wants to open up new distributor channels to penetrate new markets such as the end-user market.

This would be done first through private label relationships and expanded to distributor relations.

Cbema Urges Senate Committee To Support Trade Reform Act

WASHINGTON, D.C. – The Computer and Business Equipment Manufacturers Association (Cbema) has called upon the Senate Committee on Finance to favorably support the Trade Reform Act of 1973 (H.R. 10710) and amend it to include authority for negotiations and rules for access to supplies.

The need to prevent further deterioration in the international trading environment, which has proven so beneficial to the U.S. over the last 25 years, overrides all other issues presented in the bill, Cbema Vice-President Vico E. Henriques testified.

The industry faces "vigorous competition assisted in many countries by governmental restraints," he observed.

Since 1963, DP-related exports have grown from $371 million to $2.32 billion, while imports rose from $109 million to $918 million. "The growth possibilities of our industry have not gone unnoticed abroad," he said.

No industry, Henriques observed, can long match the concentrated action of governments which act to favor their own industry to discriminate systematically against foreign corporations. Cbema strongly supports the effective Adjustment Assistance provisions in the bill, he said.

He urged Congress and the Nixon Administration to work "as rapidly as possible for a solution acceptable to all parties" regarding the most-favored nation status extended by other nations to Eastern Europe and the USSR.

"The most appropriate action would be for the committee to address this important issue separately, but not delay initiation of the trade negotiations," he said.

"The USSR and East Europe are currently the largest undeveloped markets for our industry's products . . . There is a definite preference in these markets," Henriques said, "to purchase American goods as they are the best available. However, as in other markets, we have experienced increased competition from European and Japanese competitors," which have extended the equivalent of both most-favored nation status and credits to East Europe and the USSR.

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Contracts

Sorbus, Inc. has received a contract from Business Systems Technology, Inc. to furnish exclusive nationwide maintenance service for the company's System/3 add-on core memories.

Sorbus will also provide maintenance service for CFI Memories, Inc.

Decision Data Computer Corp. received a $303,590 contract from Incoterm Corp. to provide Model 8045 printing reader punches for use as part of a remote batch communications system Incoterm is supplying to Burlington-Northern Railway.

Hewlett-Packard has received an order for 25 HP 2100 minicomputers from Computer Solutions, Inc., developer of dedicated business systems.

Data Technology Corp. has received a contract valued at over $100,000 from CDC for 25 systems to be used in conjunction with CDC's optical character reader.

Memory Technology is supplying custom semiconductor memory arrays to Teradyne, Inc. for use in its line of M365 controllers in automatic test systems.

Scientific Time Sharing Corp. has received a contract for APL Plus time-sharing services from the U.S. Army Harry Diamond Laboratories.

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Decision Data Starts Year With Improved Finances

HORSHAM, Pa. – Decision Data Computer Corp. started the new year with a rise in earnings and revenues over the fourth quarter of last year and a hefty jump above returns from the same period a year ago.

Earnings for the three months ended March 2 reached $141,000 or 4 cents a share, including a $66,000 tax credit, compared with a loss of $396,000 or 13 cents a share a year ago.

Revenues rose 114% above those of the year-ago period, to $7.2 million from $3.4 million last year.

During the quarter, income from the lease base grew to $1.4 million, 24% over the previous fourth quarter.

Decision Data is coming closer to a 50%-50% mix in shipments to the end-user and OEM businesses with about 55% of shipments to the end-user market, President Loren A. Schultz said.

Boothe Revenues Decline

SAN FRANCISCO – Despite a drop in revenues and a $14.5 million additional depreciation charge, Boothe Computer Corp. reduced its losses for the year ended Dec. 31 from those of a year ago.

Revenues fell to $46.3 million compared with $50.3 million last year.

The firm lost $21.2 million compared with $36.5 million a year ago.

Boothe sustained operating losses, which included about $2.5 million of nonrecurring charges, of Boothe Airside Systems, Inc., PSC Technology, Inc. and Courier Terminal Systems, Inc.

The additional depreciation was necessary because of the continuing erosion in IBM 360 releasing rates, Chairman D.P. Boothe Jr. said.

As of Dec. 31, about 3% of the firm's 360 portfolio was off rent compared with about 5% a year ago.

DEC Names Nine Vice-Presidents

MAYNARD, Mass. – Digital Equipment Corp. (DEC) has promoted nine managers to the position of vice-president.

The appointments, according to DEC President Kenneth H. Olsen, do not change the present organization and reporting relationships of the company.

The new vice-presidents and their divisions are:

Richard J. Clayton, computer systems development; John Long, Decsystem-10; William H. Long, OEM; Julius Marcus, data communications; Gerald T. Moore, North American sales;

Executive Corner

and Jean-Claude Peterschmitt, Europe.

In addition, Lawrence J. Porter is vice-president, software development; Robert W. Puffer, hardware development; and John J. Schields, field service and training.

Other Appointments

■ Raymond J. Noorda, formerly executive vice-president of General Automation, Inc., has been promoted to the post of president and chief operations officer.

■ Lewis A. Barr has been appointed vice-president of marketing for the newly formed Data Communications Division of GTE Information Systems, Inc.

■ Stephen F. Keating, president of Honeywell, Inc. since 1965, has been named the company's chief executive officer.

■ Felix A. Kalinski has been elected to the board of directors of Computer Sciences Corp.

■ Kenneth L. King has been elected chairman of the board of Information Displays, Inc.

■ Herbert M. Elliott has been named vice-president, finance for the Data Products Group of Itel Corp.

■ L.C. Roskam has been promoted to the new position of vice-president, financial plans and controls for Control Data Corp.'s systems and services company.

I/O Devices Closes Business

MOUNTAIN LAKES, N.J. – I/O Devices, Inc., a firm with a couple of product designs and not enough cash, planned to close its doors April 19, terminating the employment of all personnel.

On May 20, a special shareholders meeting will be held to authorize the board of directors to sell, lease or exchange all or substantially all of the company's property and assets.

I/O seeks to sell the company as a whole or by product line, a spokesman added.

The firm's 30 char./sec Model 030 desktop printer, designed to compete with the Diablo unit, is not yet in production.

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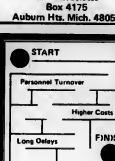

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Los Angeles Area: Bob Byrne. Robert Byrne & Assoc., 1541 Westwood Blvd., Los Angeles, Calif. 90024. Tel: (213) 477-4208.

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Earnings Nearly Double Also

STC Doubles Income With Tape Sales

LOUISVILLE, Colo. – Sales of its tape equipment helped more than double revenues at Storage Technology Corp. for the year ended Dec. 28.

Earnings rose to nearly $6 million or $1.70 a share from $3.7 million or $1.14 a share a year ago. In 1973, there was a tax credit of $1.6 million end in 1972, $1.4 million.

President Jesse I. Aweida noted the firm has now used up its operating loss carryforwards from prior years and will not have any extraordinary credits of this type available in 1974.

Tape products continued to be the major source of revenue. However, with the increase in shipments of the 3330 Series disk equipment during 1973 STC believes "that a wider acceptance of this product should result in increased disk sales during 1974," Aweida noted.

During the year, STC sold about 53% of its tape equipment production compared with about 33% during 1972.

Revenues rose to $56.6 million from $26.3 million last year. Of the 1973 figure, $39.7 million came from sales and $16.9 million from rental and service income, compared with $19 million and $7 million respectively, last year.

End-user shipments, orders and backlog all reached record levels in the fourth quarter of 1973, he said.

As of Jan. 25, 1974, the annualized revenues from company-owned and -serviced equipment had grown to about $21.6 million.

Aweida noted that during 1973 the firm took several steps designed to increase sales to both OEM and overseas purchasers.

STC acquired 90% of Promodata S.A., a French firm, signed distributor agreements with firms in two European countries and established a subsidiary in Canada.

Costs of engineering and product development reached $4.5 million in 1973, compared with $2.6 million a year ago. Of the 1973 figure, $1.5 million was spent by Disk Systems Corp. for R&D on its new disk subsystem, the "Super Disk."

By the end of 1973, STC had over 300 customer installations and had "substantially expanded its marketing and service engineering personnel," according to the annual report.

Sales to all third-party lessors totaled nearly $31 million in 1973 and $14.2 million in 1972, of which about half of the 1973 figure represented sales to B.A. Leasing Corp. as successor to an original agreement with Decimus Corp.

Cambridge Memories Watches Earnings Rise Over 1973 Marks

CONCORD, Mass. – Cambridge Memories, Inc.'s earnings and revenues in the second quarter and six months topped those of the corresponding year-ago periods, but earnings declined from the first quarter.

In addition, the firm's auditor revised downward the results of the first quarter, to earnings of $221,654 instead of the previously reported $240,869.

Revenues were set at $4.9 million rather than $5 million. The change was made because the auditor decided to write off five computer systems traded in from another company at 70% or $350,000, rather than at 100% or $500,000.

In the second quarter, earnings reached $204,856 or 15 cents a share compared with $140,076 or 11 cents a share in the same period a year ago.

Revenues reached $5.6 million compared with $2.8 million e year ago.

In the six months, earnings rose to $426,510 or 32 cents a share, from $258,488 or 20 cents a share last year.

Revenues for the half year increased to $10.5 million from $4.6 million last year.

Earnings for the second quarter and six months are after a $250,000 provision for an expected loss on an account receivable, the firm said.

Datapoint's 6 Months Sparkle

SAN ANTONIO, Texas – Datapoint Corp.'s six-month earnings nearly tripled while those of the second quarter ended Jan. 31 came close to doubling.

Despite major delays caused by a fire in January, the company is essentially on target to achieve its fiscal 1974 financial plan, President Harold E. O'Kelley said.

In the six months, earnings rose to $1.5 million or 77 cents a share from $545,000 or 32 cents a share in the year-ago period.

Comparing operating earnings shows an even more dramatic improvement, $1 million compared with $278,000 in the year-ago period.

Revenues for the period more than doubled to $14.7 million from $6.9 million.

In the quarter, earnings jumped to $767,000 or 39 cents a share, including a $224,000 tax credit, compared with $389,000 or 22 cents a share, including a $190,000 tax credit.

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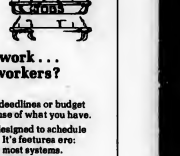

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Earnings Reports

TEKTRONIX
Four Months Ended March 3

	1974	a1973
Shr Erng	0.86	0.65
Revenue	80,435,000	60,709,000
Spec Item	b(1,463,000)	c478,000
Earnings	5,702,000	4,921,000
10 Mo Shr	1.87	1.39
Revenue	199,252,000	145,581,000
bSpec Chg	1,686,000	108,000
Earnings	16,160,000	11,979,000

a-Restated to reflect acquisition of Grass Valley Group on a pooling-of-interests basis. b-Loss from currency fluctuations. c-Gain from currency fluctuations.

CUBIC
Year Ended Dec. 31

	1973	1972
Shr Erng	3.70	3.64
Revenue	88,877,100	54,621,700
Tax Cred	1,581,800	1,448,900
Earnings	3,442,000	.05
3 Mo Shr	1,228,000	.27
Revenue	30,519,000	7,320,000
Spec Item	(512,000)	494,000
Earnings	(1,130,000)	893,000

INFOREX
Year Ended Dec. 30

	1973	1972
Shr Erng	1.63	2.81
Revenue	37,661,000	23,118,000
Tax Cred	885,000	747,000
Earnings	1,442,000	1,228,000
3 Mo Shr	.32	.27
Revenue	10,519,000	7,320,000
Spec Item	(512,000)	494,000
Earnings	(1,130,000)	893,000

COMPUTER DESIGN
Year Ended Dec. 31

	1973	1972
Earnings	$1.02	
Revenue	28,736,041	$18,582,400
Earnings	1,722,823	(678,036)

APPLIED DATA RESEARCH
Year Ended Dec. 31

	1973	a1972
Shr Erng	3.32	3.07
Revenue	10,850,457	8,757,838
Disc Op	-	(32,868)
Earnings	373,202	72,160

a-Restated.

SCAN-DATA
Year Ended Dec. 31

	1973	a1972
Shr Erng	8.06	-
Revenue	7,002,515	$4,742,010
bSpec Item	38,000	(259,000)
Earnings	92,996	(1,372,835)

a-Restated. b-In 1973, tax credit; in 1972, debit from accounting change.

ECRM
Year Ended Dec. 31

	1973	1972
Shr Erng	8.09	8.59
Revenue	5,804,948	5,389,505
Tax Cred	-	150,300
Earnings	101,198	604,102

COMTEN
Year Ended Dec. 31

	1973	1972
Shr Erng	8.30	8.11
Revenue	9,196,000	6,482,000
Tax Cred	302,000	108,000
Earnings	631,700	219,200

NATIONAL SEMICONDUCTOR
Three Months Ended March 10

	1974	1973
Shr Erng	8.32	a8.07
Revenue	52,682,000	22,886,000
Earnings	3,894,000	824,000
10 Mo Shr	.92	a.19
Revenue	153,019,000	66,772,000
Earnings	11,207,000	2,264,000

a-Adjusted to reflect a three-for-one stock split in December 1973.

UNITED DATA CENTERS
Year Ended Dec. 31

	1973	1972
Shr Erng	8.49	8.35
Revenues	11,182,889	7,799,552
Tax Cred	267,000	200,000
Earnings	719,926	490,974

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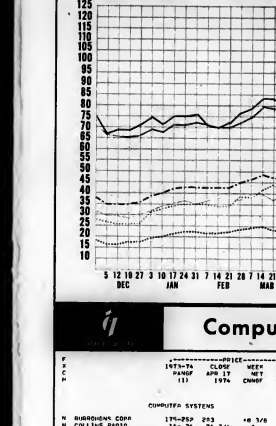

Computerworld Stock Trading Summary

All statistics compiled, computed and formatted by TRADE•QUOTES, INC. Cambridge, Mass. 02139

F		PRICE				
O		1973-74	CLOSE	WEEK	WEEK	
R		RANGE	APR 19	NET	PCT	
M		(1)	1974	CHANGE	CHANGE	
	COMPUTER SYSTEMS					
N	BURROUGHS CORP	174-252	253	+8 3/8	+3.2	
R	COLLINS RADIO	14- 24	24 3/4	- 1/8	-0.5	
O	COMPUTER AUTOMATION	8- 20	11 1/4	+ 1/4	+1.1	
N	CONTROL DATA CORP	31- 69	33 1/4	+1 1/4	+3.9	
N	DATA GENERAL CORP	24- 48	48	+ 3/4	+2.1	
O	DATAPOINT CORP	21- 38	21 1/4	- 1/4	-1.2	
O	DIGITAL COMM CONTROL	7- 4	3 5/8	- 1/2	-12.1	
N	DIGITAL EQUIPMENT	73-121	111 1/2	+4 5/8	+4.3	
N	ELECTRONIC ASSOC.	7- 9	7 5/8	- 1/8	-1.6	
N	ELECTRONIC ENGINEER.	8- 18	13 3/4	+1 1/2	+10.0	
N	FABRIDYN	23- 48	36	+1 3/4	+5.1	
O	GENERAL AUTOMATION	23- 40	36	+2 3/4	+8.2	
O	GRI COMPUTER CORP	1- 3	1 1/4	- 1/8	-9.0	
N	HEWLETT-PACKARD CO	71- 96	96 1/2	+2	+2.1	
N	HONEYWELL INC	68-138	79 3/4	+1 3/4	+2.3	
N	IBM	277-343	294 1/2	+4	+1.7	
O	INTEGRATA INC	7- 29	21 1/4	- 1/4	+1.1	
O	MICRODATA CORP	2- 10	3 1/4	- 1/4	-6.6	
N	NCR	27- 44	37 3/4	+ 1/8	+0.3	
N	PERKIN ELM CO	27- 54	31	+ 1/4	+0.8	
N	SINGER CO	33- 74	32 3/4	+1 1/2	+4.3	
N	SPERRY RAND	38- 46	40 1/4	+1 1/2	+3.9	
N	SYSTEMS ENGR. LABS	3- 9	4 1/2	+ 1/4	+5.8	
N	TEXAS INSTRUMENTS	83-127	96 1/4	- 3/8	-0.3	
O	ULTIMATE SYSTEMS INC	1- 11	3	- 1/4	-7.7	
N	UNIVAC ASSOCIATES	13- 31	17 1/4	+ 1/4	+1.7	
N	WANG LABS.	13- 34	15 3/4	+ 1/8	+0.7	
M	XEROX CORP	104-169	117 1/2	+5 1/4	+4.8	
	LEASING COMPANIES					
A	ADDTNE COMPUTER	1- 5	1 1/4	0	0.0	
O	ARCHIMEDES CORP.	1- 2	2 1/4	0	0.0	
O	CAMPBELL INC	1- 3	1 1/4	0	0.0	
O	COMMERCE GROUP CORP	3- 6	5 3/8	- 1/8	+2.2	
O	COMPUTER EXCHANGE	2- 5	3	0	0.0	
O	COMPUTER INVSTRS GRP	2- 9	2 1/8	0	0.0	
O	COMPUTER INSTALLATIONS	1- 3	1	- 3/8	-50.0	
O	COMPUTER RENTAL	1- 3	1 3/4	0	0.0	
A	DCL INC	1- 3	1 3/4	0	0.0	
A	DPF INC	1- 3	3 1/4	+ 1/8	+3.5	
O	EDP RESOURCES	3- 6	3 5/8	0	0.0	
A	GRANITE MGT	1- 3	1 3/4	- 1/8	-6.6	
A	PREVMOUNT COMPUTR	1- 3	1 1/4	0	0.0	
A	TPC	1- 4	1 1/4	0	0.0	
N	LEASCO CORP	8- 18	10 1/2	+ 1/8	+1.2	
O	LEASPAC CORP	3- 7	4 1/2	+ 1/8	+2.8	
O	LECTRO MGT INC	1- 2	3/4	0	0.0	
O	MRS INC	2- 15	3 3/4	- 1/8	-3.2	
A	PIONEER TEX CORP	4- 8	3 3/4	0	0.0	
A	RICHWOOD COMPUTER	1- 3	7/8	- 1/4	-18.0	
N	U.S. LEASING	10- 36	19	+1 3/4	+10.1	

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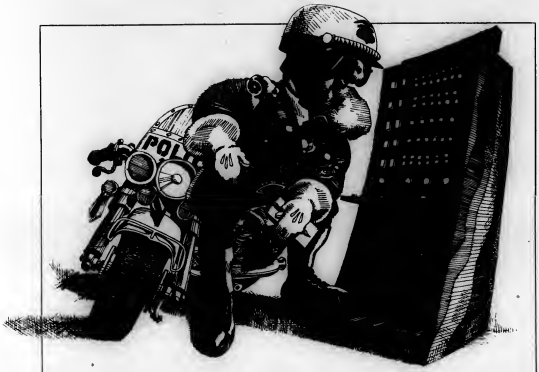
ADDITIONAL MARKINGSTS DAVE=THE-COMPTEN
D=T-F PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

F		PRICE				
O		1973-74	CLOSE	WEEK	WEEK	
R		RANGE	APR 19	NET	PCT	
M		(1)	1974	CHANGE	CHANGE	
	SOFTWARE & EDP SERVICES					
O	ADVANCED COMP TECH	1- 7	1 1/4	0	0.0	
A	APPLIED DATA RES.	2- 4	2 3/4	+ 1/4	+11.7	
A	APPLIED LOGIC	1- 3	1	0	0.0	
N	AUTOMATIC DATA PROC	39- 64	47 3/8	+2 3/8	+5.3	
O	BRANDON APPLIED SYST	1- 4	1 1/4	+ 1/4	+25.1	
O	CENTRAL DATA SYSTEMS	3- 6	3 1/2	0	0.0	
O	COMPUTER DIMENSIONS	1- 4	2	0	0.0	
O	COMPUTER HORIZONS	1- 4	3 1/2	0	0.0	
O	COMPUTER NETWORK	1- 3	1 1/4	+ 1/4	+9.0	
O	COMPUTER SCIENCES	2- 4	3 1/4	0	0.0	
O	COMPUTER TASK GROUP	2- 4	3 1/2	0	0.0	
O	COMPUTER TECHNOLOGY	1- 3	1 1/2	0	0.0	
O	COMPUTER USAGE	3- 6	3 1/2	0	0.0	
O	COMRESS	1- 2	1 1/2	0	0.0	
O	CONSULINE	1- 3	2 3/4	0	0.0	
N	CORDURA CORP	1- 2	1 1/2	0	0.0	
O	DATAMEC	1- 3	1 1/2	0	0.0	
A	ELECT COMP PROG	1- 2	1	0	0.0	
N	FILETRON DATA SYS.	12- 24	14 1/4	+1	+7.5	
O	INFOMATIONAL INC	1- 2	1 1/2	+ 1/4	+33.3	
O	INFOMATICS	2- 7	4 3/4	0	0.0	
O	INFORMATICS CORP	1- 3	3/4	0	0.0	
O	INS. COMPUTER MARKET.	1- 4	1	- 1/4	+11.1	
O	INTERACTIVE DATA	2- 5	3 3/4	0	0.0	
O	KEYSTONE COMP	4- 17	4 1/2	0	0.0	
O	LOGICON	2- 5	3 3/4	- 1/8	-3.2	
O	MANAGEMENT DATA	1- 2	1 1/2	- 1/4	-7.6	
O	NATIONAL CSS INC	14- 42	26	+1 1/2	+6.1	
O	NATIONAL COMPUTR CO	1- 2	1/2	0	0.0	
O	NATIONAL INFO SVCES	1- 2	1/2	0	0.0	
O	ON LINE SYSTEMS INC	19- 29	20	+ 3/4	+3.9	
N	PLANNING RESEARCH	2- 7	2 5/8	0	0.0	
O	PROGRAMMING METHODS	2- 5	3 1/2	0	0.0	
O	PROGRAMMING & SYS	1- 3	1 1/8	+ 1/8	+12.5	
O	QUANTEX INC	2- 5	3 1/4	+ 1/4	+8.3	
O	SCIENTIFIC COMPUTERS	1- 3	1	+ 1/4	+34.9	
O	SIMULICITY COMPUTR	1- 4	1 1/4	0	0.0	
O	TCC INC	1- 1	3/4	0	0.0	
O	TELEVIDEO INC	2- 15	3 7/8	+ 1/4	+6.9	
O	UNITEN DATA CENTFD	1- 4	3 1/2	+ 1/4	+6.8	
A	UPS SYSTEMS	2- 8	3 3/8	+ 1/8	+3.8	
N	WYLY CORP	1- 11	3 1/2	- 1/2	-3.4	
	PERIPHERALS & SUBSYSTEMS					
N	ADDRESSOGRAPH-MULT	8- 34	9 5/8	- 1/8	-1.4	
O	ADVANCED MEMORY SYS	2- 23	3 3/4	+ 1/4	+5.5	
O	AMPEX CORP	3- 7	3 3/4	0	0.0	
O	ANDERSON JACOBSON	2- 11	3 3/4	+ 1/4	+5.5	
O	BRUNING MEDICAL ELEC	4- 10	4 1/2	- 1/4	-5.2	
O	CALCOMP	4- 12	7 1/2	+ 1/4	+3.4	
N	CALCOMP-MEMOREX & MF	4- 12	7 1/2	+ 1/4	+3.4	
N	CALCOMP	4- 12	7 1/2	+ 1/4	+3.4	
O	CAMBRIDGE MEMORIES	8- 17	10 3/4	- 1/4	+2.3	
O	CENTRONICS DATA COMP	13- 29	20	+ 1/2	+2.5	
O	COMEX CORP	8- 19	12	+ 3/4	+6.8	
O	COMMUTRONICS	1- 3	3/4	0	0.0	

E		PRICE				
X		1973-74	CLOSE	WEEK	WEEK	
C		RANGE	APR 19	NET	PCT	
N		(1)	1974	CHANGE	CHANGE	
O	COMPUTER CONNING	1- 4	7/8	- 1/8	-12.5	
C	COMPUTER EQUIPMENT	1- 4	1 1/2	0	0.0	
O	COMPUTER MACHINERY	1- 13	1	- 3/8	-27.2	
O	COMPUTER PERIPHERALS	1- 4	1 1/8	0	0.0	
N	COMRAC CORP	13- 30	29 1/2	+2	+7.3	
O	DATA ACCESS SYSTEMS	1- 3	2	0	0.0	
O	DATA 100	7- 10	11	+1	+10.0	
A	DATA PRODUCTS CORP	2- 5	4	- 1/4	-6.0	
O	DATA RECOGNITION	1- 3	1/2	0	0.0	
O	DATA TECHNOLOGY	1- 4	3 1/4	- 1/4	-7.1	
O	DECISION DATA CORPUT	4- 43	8 5/8	+1	+11.4	
O	DELTA DATA SYSTEMS	1- 3	1 1/4	0	0.0	
O	DIVAN CONTROLS	1- 4	1 1/2	- 1/4	-14.2	
N	ELECTRONIC N Y	3- 5	3 3/4	- 1/8	-3.2	
O	FABRI-TEK	2- 5	2 1/2	- 1/8	-4.7	
N	GENERAL COMPUTER SYS	2- 5	2 1/2	- 1/8	-4.7	
N	GENERAL ELECTRIC	51- 74	64 3/4	+1	+1.6	
N	HEWLETT-PACKARD CO	71- 96	96 1/2	+2	+2.1	
O	INFOMRX INC	2- 23	2 5/8	+ 1/8	+5.0	
O	INFORMATION DISPLAYS	1- 2	3/8	- 1/8	-25.0	
O	INFORMATION INTL INC	8- 14	10 1/2	- 1/4	+2.4	
O	LIMITY ELECTRONICS	3- 6	3 7/8	0	0.0	
O	MANAGEMENT ASSIST	1- 1	1/2	0	0.0	
N	MFRONEX	2- 10	3 7/8	+ 1/8	+3.3	
N	MILGO ELECTRONICS	10- 24	15 1/2	+ 1/2	+3.3	
N	NORTHAM DATA SCI	2- 13	3 1/2	+ 1/8	+3.6	
O	OMNI COMPUTER SYST.	1- 3	2	0	0.0	
O	OPTICAL SCANNING	2- 8	3 5/8	0	0.0	
O	PANTRONIX	2- 8	3 3/4	0	0.0	
O	PERIPHERAL SYSTEMS	3- 7	3 3/4	0	0.0	
O	POTTER INSTRUMENT	3- 7	3 3/4	+ 1/8	+3.4	
O	PRECISION INST.	1- 3	1 1/2	+ 1/4	+14.2	
O	QUANTAR CORP	1- 10	1 1/2	+ 1/4	+14.2	
O	RECOGNITION EQUIP	1- 10	1 1/2	+ 1/4	+14.2	
N	SANDERS ASSOCIATES	4- 14	5 1/2	+ 1/4	+4.7	
O	SCAN DATA	1- 4	1 1/4	0	0.0	
O	STORAGE TECHNOLOGY	11- 34	13 1/4	- 1/2	-3.6	
O	TECOM INC	1- 3	1 1/4	0	0.0	
O	TALLY CORP.	2- 14	3 7/8	+ 1/8	+3.3	
O	TEC INC	5- 9	5 1/2	- 1/4	-4.3	
O	TELEFINANCE INC	4- 10	5 3/4	- 1/4	-4.1	
N	TELEX	3- N	5 1/2	- 1/4	-4.3	
O	UNIMICH INC	5- 14	12	- 1/2	-4.0	
N	WILTEC INC	4- 10	5 3/4	- 1/4	-4.1	
	SUPPLIES & ACCESSORIES					
O	BALTIMORE RUS FORMS	4- 8	5 3/4	- 1/4	-4.2	
O	BARRY WRIGHT	4- 13	7 7/8	- 1/4	-3.1	
O	CYBERNETICS INC	1- 3	1 1/4	0	0.0	
N	DATA PRODUCTS CORP	32- 44	34 1/4	+6 1/4	+15.4	
O	DIMPLEX PRODUCTS INC	4- 10	5 3/4	- 1/4	-4.2	
O	FANIS MFG. FORMS	4- 8	5 1/2	- 1/4	-4.3	
O	GRAHAM MAGNETICS	7- 20	8 1/4	+ 1/4	+3.1	
O	GRI CONTROLS	7- 12	10 1/4	+ 1/4	+2.5	
O	HP-COMPUTER	68- 91	75 1/4	+1 3/4	+2.4	
O	HOUSTON INSTR LTD	40- 80	46 3/4	- 1/4	-0.5	
O	HUNTON CORP	35- 51	36	- 3/4	-2.0	
O	REYNOLDS & REYNOLD	31- 51	38	+ 3/4	+1.7	
O	STANDARD REGISTER	11- 24	15 1/2	+1 1/2	+10.7	
O	TAB PRODUCTS CO	12- 20	15 1/2	+1 1/2	+10.7	
O	TRW	23- 33	29 1/8	+ 1/8	+0.4	
O	WABASH MAGNETICS	4- 8	5 1/4	- 1/4	-4.5	
N	WALLACE BUS FORM	14- 24	19 1/4	+ 5/8	+3.3	



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